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ABSTRACT

The research design discussed here focuses on four major questions: (1) what the relative effectiveness of well-implemented "individualized" instruction vs. well-implemented "standardized" instruction for recipients of compensatory education in terms of reading achievement, mathematics achievement and classroom climate is; (2) how specificity of treatment of the instructional tasks, taken one at a time and in sequential combinations, relates to cognitive and affective outcomes; (3) how specificity of the treatment of instructional tasks taken along with other variables of concern relates to student achievement; and, (4) what the conditions that contribute to differences in degree of implementation are. Instrumentation for assessing program implementation at both the selection and observation stages of the study has been produced. The sampling and selection design was structured to sample systematically along all basic dimensions including the instructional setting dimension. The use of both the California Achievement Test and selected items from the National Assessment of Educational Progress are recommended as criterion achievement measures. The analytic procedure recommendation for the first study question is a two by two factorial design employing univariate and multivariate analysis of covariance (controlling for IQ and socioeconomic status) on reading, mathematics, and student perceived classroom climate. (Author/JM)

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A DESIGN TO STUDY THE EFFECTIVENESS OF WELL-IMPLEMENTED INDIVIDUALIZED INSTRUCTION IN COMPENSATORY READING AND MATHEMATICS PROGRAMS

FINAL REPORT

October 31, 1975

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October 31, 1975

Mr. James A. Giammo
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Dear Mr. Giammo:

Pursuant to our commitment under Contract NIE-400-75-0022 we are making delivery of the accompanying copies of *A Design to Study the Effectiveness of Well-Implemented Individualized Instruction in Compensatory Reading and Mathematics Programs, Grades K-4*. Additional copies are being delivered this date to Dr. Joy Frechtling, Government Project Officer, Educational Equity Task Force, National Institute of Education.

On behalf of ourselves and our Executive Director, R. G. Scanlon, we wish to express our appreciation for the efficient and congenial manner in which you and Dr. Frechtling have managed the government!s responsibilities under this contract. We are confident that you will find our service in order as well. If there should be questions, please contact us; we promise our prompt response.

Sincerely,

David C. Helms Jr.

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A DESIGN TO STUDY THE EFFECTIVENESS OF WELL-IMPLEMENTED INDIVIDUALIZED INSTRUCTION IN COMPENSATORY READING AND MATHEMATICS PROGRAMS

FINAL REPORT
October 31, 1975

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I. INTRODUCTION

Compensatory education became a concern of primary interest nearly a decade after the United States Supreme Court decision in Brown vs Topeka when public school officials were under massive pressure to improve the education of impoverished black children. In the early 1960's, pointed arguments by J. McVicker-Hunt (1961) and seductive data from enrichment-type programs (mostly supported by private foundations) directed by such researchers as Martin Deutsch and Susan Gray seemingly put to rest the long-espoused doctrine that disadvantaged racial and social-class groups of people were poorly endowed by nature.

Academic failure and progressive retardation, the cumulative deficit (Deutsch, 1967) found so frequently among poor children, led to the cultural deprivation hypothesis, a causal argument based on early socialization under conditions of poverty and discrimination. While interest in this hypothesis is still much in evidence, it was challenged successfully by educators who laid the blame for academic failures among disadvantaged children to "grossly inept practices in the schools" (Wilkerson, 1970).

In 1965, Congress passed the Elementary and Secondary Education Act. Title I of this legislation represented the first major allocation of funds aimed toward closing the educational gap between the disadvantaged and the nondisadvantaged. Title I ESEA was not the only compensatory education effort of the federal government, however. Disadvantaged students are also aided under such programs as Head Start and Follow Through. While compensatory programs have varied considerably with respect to what the funds have been expended upon, they have all shared the common notion that the funds were to help close the achievement gap as measured by generally accepted outcome measures.

During the early years, federal compensatory funds were used as a general aid to education with little attention to how the funds were directed to the target population or what use was made of the funds. As the Senate Select Committee on Equality of Educational Opportunity expressed itself:

> ... in a real sense, compensatory education has never had a chance--services have often been diluted to the point of meaningless (sic), and even extended to non-eligible children. Funds have been expended on equipment which is never put to effective use.

Equitable and efficient procedures to assure that [illegible] funds are expended upon the target population for the purpose intended have been difficult to achieve at both the federal and local levels. A significant effort by the Congress to effect this assurance is contained in The Education Amendments of 1970. According to this legislation, school districts which receive funds under Title I for children of low-income families must first use state and local funds to provide services which are comparable, at least, to services being provided by districts which are not receiving funds under Title I. Implementation of Congress' intention would have the effect of assuring that districts receiving Title I funds will regard these funds as supplementary and for the purpose of mounting special attacks upon the educational deficits of compensatory students.

At the school level, former requirements that Title I funds be used exclusively for the benefit of compensatory students created special problems for the delivery of instruction. Prevalent practices employed by schools to accommodate the exclusivity requirement included: (1) special in-class tutors, (2) "pull out" of compensatory students from mainstream classes for special instruction, and (3) formation of homogeneously grouped classes of compensatory students.

It has been argued, however, that discriminant provision of special instruction for compensatory students has the effect of labeling them as "disadvantaged" with consequent negative effects (White et.al., 1973). On the other hand, not limiting services to targeted students has the potential disadvantage of spreading funds so thinly that no educational effects could be reasonably expected.

Equally as troublesome as the problem of targeting funds was the determination of what needs to be done with available funds to raise the educational achievement of compensatory students to a par with their non-compensatory counterparts. Despite the generally poor caliber of studies of compensatory education, several facts have been common to studies of successful compensatory education programs (e.g., Wargo et.al., 1971 and Holzman and Boes, 1973). These studies have observed that the shared characteristics of successful programs have been careful planning, including clear statement of objectives; teacher training in the method of the program; parent involvement; high intensity of treatment; and individualization of instruction. The latter characteristic, individualized instruction, is the focus of this study.

If the evidence were clearly convincing that individualized instruction was the most effective instructional mode for compensatory education students (i.e., if students receiving such instruction achieved significantly more than similar students taught in other ways) then individualization could be viewed as a singular solution to both the problem of separating (labeling) compensatory education students for differential instruction and the problem of instructional effectiveness.

However, apart from the question of compensatory education, the overall evidence on the effectiveness of individualized instruction is ambiguous; i.e., positive effects have not been consistent over time and place. Moreover, the meaning of the term "individualization" is itself in considerable dispute. So many programs which, in many ways, are radically different have been advanced under the label that, according to Gibbons (1970), the term has lost its value as a useful categorizer. The ambiguities of both meaning and effects may be related. Indeed, it can be argued persuasively that the variation in outcome effectiveness of individualized instruction is, in fact, a reflection of its various characteristics in various contexts as it is employed for a variety of purposes.

Studies of individualization and compensatory education have suffered most of the same flaws that have marred most studies of educational innovation in the past. The flaws that we have observed to be particularly pervasive are the following:

1. Failure to ascertain the exact nature of the intended treatment or treatments.
2. Failure to ascertain the exact nature of the intended outcomes of the treatments.
3. Failure to verify that the intended treatments were in place (and not confounded with comparative treatments) during the period of evaluation.
4. Failure to meet the technical conditions under which summative judgments of effects could be validly made.
5. Failure to provide sufficient opportunity for maximization of treatment-outcomes variance to occur.
6. Failure to employ criterion instruments that would be consistent with intended effects in terms of kind and scope.
7. Failure to specify the conditions which qualify the treatment-outcome relationships in specific contexts.

Thus far, we have briefly surveyed the intentions of the Congress with respect to compensatory education, the difficulties that have hampered their implementation, and the history of inadequate evaluations that have deprived the Congress of the information necessary for an enlightened review of compensatory policy effectiveness, and a useful guide to policy reformulation. Given this state of affairs, Congress included in the Educational Amendments of 1974 instructions to the National Institute of Education to design and conduct a comprehensive study of compensatory education.

On the basis of this new research, Congress intends to draw conclusions about the need for further legislation and programs in compensatory education, and to use the results in its deliberations in 1977, concerning reauthorization of Title I of the Elementary and Secondary Education Act. The overall investigation is to be very broad, but the study design described in the body of this document is only intended to provide evidence about "the effectiveness of individualized instruction as it is currently used by compensatory programs in schools" according to RFP NIE-R-75-0022. The RFP further states that:

> The study is not meant to be a comprehensive survey but rather a concentrated examination of selected programs which provide individualized classroom instruction. The major focus of the study will be on assessing program success in the areas of reading and mathematics achievement. In addition, however, some more general implications of individualized instruction for the classroom environment will be examined.

The study we have designed is directly responsive to the concerns of the NIE as expressed in the RFP, and great care has been taken to attend to the problems and flaws of research evaluation that have been noted above. However, our experience in developing and evaluating programs of individualized instruction leads us to believe that no strong evidence of the effectiveness of individualized instruction is apt to be discerned from a simple comparison of the effects of "individualized instruction" with the effects of "standardized instruction."

The multiplicity of instructional plans grouped under the label "individualized" vary widely in their emphases, and, frequently, their operational interpretations of the term contradict each other to the end that significant effects of some plans likely will be masked by offsetting effects of others. Moreover, some features of instruction formerly associated only with individualized instruction have been adopted and/or adapted for use in standardized classrooms such that individualized and standardized treatments of instruction are somewhat confounded, and this precludes any clear discrimination of instructional treatment effects by direct comparison of labeled groups.

We are in agreement with Jamison, Suppes and Wells (1974) that what is needed is to ascertain more exactly the nature of conditions that do make significant particular factors of instruction. The study should produce findings that relate outcome effects to treatment variations under specified conditions. Thus, we have gone beyond the direct comparison question in designing a study that will deliver information that should be critically important to NIE and the Congress.

The following overview of the study design highlights the principal features of the study and the rationale that decided their inclusion.

II. OVERVIEW OF THE STUDY DESIGN

The study described in this document has been designed to fit the study requirements stipulated by the NIE-RFP. Every effort has been made to accommodate the many constraints and principal issues identified by the NIE.

Design requirements - The NIE intended that the study design for Survey II provide the means of investigating the contention that individualized instruction is especially effective in promoting achievement gains in compensatory situations. It was specified that a comparative study be designed "to assess the effectiveness of individualized instruction as it is currently used by compensatory programs in schools" and that "standardized instruction" be used for comparison purposes.

Also, study conditions should conform with the requirement that the effectiveness comparison involve only "well-implemented programs of both types" and that "in-depth observation of programs" be made "to fully describe their operating characteristics, to determine degree of implementation, and to describe settings where adequate implementation may be difficult to achieve."

Finally, the NIE required that the effectiveness of programs "be assessed by measures of reading and mathematics and by (program) effects on the classroom environment."

Among the design issues of special importance to the NIE were:

- establishment of criteria for defining programs as individualized or standardized;

- techniques to be used in assessing program implementation both for selection and validation purposes;

- the development or identification of measures for assessing the quality of implementation along with procedures for determining the reliability of such measures;

- procedures for relating differences in level of implementation to both program and outcome variables;

- a selection procedure that provided for systematic sampling of programs along an instructional setting dimension; and

- the identification of criterion measures for achievement with appropriate testing strategies.

A. THE DESIGN

In order to be fully responsive to NIE's concerns we have developed four major study questions with appropriate specifications and procedures for addressing each. The Study Questions are:

(1) *What is the relative effectiveness of well-implemented "individualized" instruction vs. well-implemented "standardized" instruction for recipients of compensatory education in terms of reading achievement, mathematics achievement and classroom climate?*

____________ *when the recipients of compensatory education receive instruction as a separate group and when they are instructed along with non-targeted children?*

What is the relationship of degree of implementation of various programs to student outcome variables?

(2) *How does specificity of treatment of the instructional tasks, taken one at a time and in sequential combinations, relate to cognitive and affective outcomes?*

How does treatment of the instructional tasks together with classroom climate relate to cognitive and affective outcomes?

(3) *How does specificity of the treatment of instructional tasks taken along with other variables of concern relate to student achievement?*

(4) *What are the conditions that contribute to differences in degree of implementation?*

The first study question is intended to be a direct representation of NIE's interests as stated in the RFP. The question implies a straightforward summative approach to determining which of two instructional techniques are more effective for increasing achievement of compensatory students. The comparison can be made survey-style, assessing student achievement at a single point in time, categorizing instructional programs as well-implemented individualized or well-implemented standardized programs, mainstream or separate, and making the required comparison. The approach is direct and uncomplicated and may provide straightforward and unequivocal information to the Congress. For this reason, we have included in the study design the means for responding to the effectiveness comparison question as stated and have included two subquestions which reflect the specific concerns of the NIE regarding the effectiveness of mainstream vs separate instruction and the relationship of degree of program implementation to student outcomes.

The effectiveness comparisons of Study Question One (parts a and b) require little more than post treatment testing on the criterion measures of student perceived classroom climate and reading and mathematics achievement; a means of identifying programs as individualized or standardized; a means of identifying well-implemented programs of both instructional types; and the identification of mainstream and separate instructional settings.

In order to achieve a dichotomization of program types we have recommended that instructional plans be categorized as individualized or standardized on the basis of instructional unit size attended to for each of a common set of instructional tasks. We have recommended a standardized achievement test that can be used in a way to reduce "floor and ceiling" effects. We have also recommended use of criterion referenced exercises from the National Assessment of Educational Progress for the derivation of special comparison information that is unique with these items. The analysis recommended for investigating the effectiveness of individualized or standardized instruction and mainstream vs separate instructional settings is a 2 (program) x 2 (setting) factorial design employing univariate and multivariate analyses of covariance (student IQ and SES) on reading, mathematics and student perceived classroom climate.

Since it is not clear who the Congress or the NIE refers to as compensatory students we have recommended that the analysis be carried out separately for students qualifying on (1) a poverty criterion, (2) an educational need criterion, and (3) both groups together. Degree of implementation in the general "individualized" and "standardized" cases we have arbitrarily defined as consistency of treatment over time.

We are reasonably certain, however straightforward and unequivocal the information obtained from such a comparison may seem to be, that the findings from such a comparison will not be very meaningful without further specification of the underlying differences among programs claiming to be individualized and among programs claiming to be standardized and of the overlap that exists between programs of both types. For this reason, we have developed Study Question Two that requires an extension of the design for Study Question One and relates variation of instructional task treatment with outcomes, regardless of program labels. That is, labels "individualized" and "standardized" will be ignored. Study Question Two, then, requires consideration of the same set of instructional tasks discussed under Question One, but whereas the tasks in Study Question One were looked at only in terms of instructional unit size, this time treatment of the instructional tasks is examined in terms of (1) instructional unit size and (2) the level of attention given the task. Under Study Question Two it will be necessary to relate student gain scores to climate measures and instructional task treatments.

Three analyses are proposed for this part of the design: commonality analysis (Mood, 1971), a series of stepdown regression analyses and canonical correlation.

Study Question Three has been developed in response to the NIE's request that study plans include provision for determining effects of program variables together with other variables and "include specifications for arguing causal relationships between program and outcome variables." We have set out such specifications in a hypothetical path model. The model contains nodes that include sets of composite variables derived from the total set of variables used in the study design. Procedures have been specified for selecting constituent variables for a priori composites and subcomposites for assessing the power of the model to explain variance in student achievement.

Finally, Study Question Four was included to provide the means for examining those conditions that may make it difficult to achieve good implementation.

While it might seem that we have designed four separate studies, most design features that we have selected or developed have value across study questions. For the sake of clarity, we have organized this document to treat the study questions independently. However, the majority of the design features are discussed under Study Question One and only differences and additions are noted under subsequent questions.

Some principal features of the design are discussed below along with discussion of some of the design issues of special interest to the NIE.

Defining individualized and standardized instruction - We have chosen to define program types in terms of a set of common instructional tasks. The tasks are defined under the Rationale for Selection of Variables, Definitions and Instrumentation section of Question One. Other specific design issues dealt with in this section are criteria for defining programs as individualized and standardized instruction, techniques to be used in assessing program implementation, and the criteria to be used in attributing the quality "well-implemented" to an instructional program. Instructional task treatments are fully defined under the Study Variable section of Study Question Two.

Assessing implementation - We have produced the instrumentation for assessing program implementation at both the selection and observation stages of the study. Preliminary tryouts of the instrument indicate that with minimal training experienced curriculum staff are able to use the measure with good consistency over treatment types. For the study itself we recommend that training be continued until inter-rater reliabilities reach a minimum of .80 for simulated and on-site observations. Suggested procedures for training are contained in the Appendix. Procedures to be used in relating degree of implementation to outcomes are discussed in the analysis section for Study Question One, part c.

Sampling and selection - The sampling and selection design was structured to sample systematically along all basic dimensions including the instructional setting dimension. We anticipate that real world complexities will make it difficult to identify settings as either mainstream or separate instruction. The definitions we have provided for this purpose should be useful in making the necessary distinctions. They are located in the Sampling and Selection section under Study Question One. Most of the selection procedures have been tried out and revisions have been made on interview forms where they were needed. All forms to be used in selection are to be found in the Appendix.

Criterion achievement measures- We have recommended the use of both the California Achievement Test and selected items from the National Assessment of Educational Progress. The features that we feel make each a desirable choice for this study are discussed under the Question One section "Rationale for Selection of Variables, Definitions and Instrumentation."

Analysis- The analytic procedure recommended for Study Question One is a 2 x 2 factorial design employing univariate and multivariate analysis of covariance (IQ and SES) on reading, mathematics and student perceived classroom climate. This analytic procedure we recommend should be performed separately for students identified as compensatory on (1) a poverty criterion, (2) an educational criterion, and (3) both groups together.

For Study Question Two, three analyses are recommended. They are commonality analysis (Mood, 1971), stepdown regression analyses and canonical correlation. Under Study Question Three, we recommend the method of positioning variance in multiple regression analysis; stepwise regression analysis; factor analysis and path analysis. Multiple discriminant analysis on predetermined groups is recommended for Study Question Four.

III. METHODOLOGY

A. STUDY QUESTION ONE

1. Rationale for Selection of Variables, Definitions and Instrumentation

Based upon the directions and specifications set out by the NIE in its RFP, it seems clear to us that the study question of main interest is the following.

a. *What is the relative effectiveness of well-implemented "individualized" instruction vs. well-implemented "standardized" instruction for recipients of compensatory education in terms of reading achievement, mathematics achievement and classroom climate?*

b. __________ *when the recipients of compensatory education are instructed as a separate group and when they are instructed along with non-targeted children?*

c. *What is the relationship of degree of implementation to outcome variables?*

Essentially, Question One focuses upon assessment and comparison of the outcomes of two instructional program types. It is implicit in the question that outcome effects are to be attributed in this question to the respective instructional program types with but two qualifying conditions, instructional setting and degree of program implementation. While the labels suggest easily identifiable instructional settings, "mainstream" and "separate," the complexity of the real world of schools belies this simplicity. Discussion of our strategy for identification of settings is reserved to the section on sampling and selection procedures. The remaining variables of principal interest in this question are defined and discussed below.

Instructional program in this study design refers to the practices, procedures and materials of instruction that are articulated in some systematic way to enhance the achievement by learners of some intended set of outcomes. Programs differ in terms of their processes and materials for attending to a set of generic instructional tasks; but it is our view of the classroom that teachers and programs, whatever their labels, give some level of attention, more or less specific, to each of these tasks for each student, more or less specifically. We recommend that these tasks constitute the common set of program variables for identifying "individualized" and "standardized" programs of instruction and for assessing their degrees of implementation.

Glaser (1963) identified a set of basic instructional tasks which we have modified and elaborated for purposes of this design. Modification and elaboration were guided by our concern that program variables be adequately comprehensive and represented by moderately-high inference observations. The instructional tasks (program variables) recommended are:

1. Provision of Curriculum Opportunity
2. Statements of Curriculum Intentions
3. Curriculum Placement Decision
4. Adjusting Rate of Instruction
5. Provision for Individual Responding
6. Provision for Individual Feedback
7. Monitoring Individual Progress
8. Performance Standard for Advancement
9. Evaluation of Performance
10. Matching Learners with Next Instruction

Provision of Curriculum Opportunity refers to the opportunity for learning that is provided for learners. Whether or not the opportunity is adequate for each learner, individually, will depend upon the relevance of what is offered, the learner's extant state of achievement and the learner's potential for growth during the school year.

Statements of Curricular Intentions describe potential outcomes of instruction and learning. They can be stated for individuals, variable subgroups, or the class group as a whole. They may simply state what is to be offered and not what is to be accomplished by whom. In this event, the teacher makes the decisions about to whom they are to apply and to what extent.

Curricular Placement Decision is the task that determines the point-of-entry into the curriculum for the individual, the variable subgroups of the class, or the class group as a whole.

Adjusting Rate of Instruction, wherever the locus of control, regulates the rate at which new content for learning is made available to learners. The rate may or may not be appropriate for anyone but, nevertheless, it will be set for individuals, individually; or variable subgroups, separately; or for the class group, as a whole.

Provision for Individual Responding by students implements the assertions of Piaget and behaviorists that learners learn by acting upon what is to be learned. Although group responding does occur, individual responding is the dominant mode in both individualized and standardized instruction. What is additionally important and the aspect of concern here is the frequency of response opportunity for individuals. One expects that individualization affords greater frequency of opportunity for individuals to respond as individuals than does standardized instruction.

Provision for Individual Feedback includes all kinds of information directed to the learner relative to the learner's progress. Accuracy of responses, identification of errors, cues, suggestions and leading questions are all examples of informational feedback. Feedback may be oral or in writing. As with responding, it is recognized that feedback is sometimes given to groups but is mostly intended for individual use even when offered as a general announcement. It is generally assumed that individualization provides for more frequent feedback which is the concern here.

Monitoring Individual Progress through the content for learning takes the form of frequent checks of accuracy of pupil's work samples, present position of pupil in the instructional sequence, adequacy of pupil's rate of progress, evidence from a variety of sources of pupil's need for assistance. With this task, also, the concern is one of frequency.

Performance Standard for Advancement may be applied to each individual in the class; or to variable subgroups as groups; or to the class as a whole. The standard is the level of performance that must be attained by the learners; e.g., 80% or better on a task.

Evaluation of Performance is a judgment of the performance of learners relative to some standard of expectation. Performances of learners may be judged in terms of the mean performance of the class or variable subgroup, or performances of individuals may be judged individually.

Matching Learners with Next Instruction can be arranged for individuals individually, or for variable subgroups of the class separately or the class as a whole. Matching presumes some kind of assessment of the learner's needs and provision of appropriate instruction. Assessment and matching may be by teacher or learner and may be overt or unobtrusive.

It should be noted that, while some additional tasks (variables) could logically be included in our program list (e.g., curriculum sequence), our experience indicates that determination of specificity of treatment, for those we have deliberately excluded, requires very high inference observations for which inter-observer reliability is very low.

Each of the program variables varies in terms of the specificity of treatment it receives during the instructional process. Specificity of treatment can be regarded as loosely analogous to the vector sum of the dimensions: instructional unit size and level of attention.

Most educators will agree that achievement likely will be greatest when learners and instruction are optimally matched according to the needs and competencies of the learners, individually. However, educators seem to be sharply divided as to whether the instructional tasks are most effectively attended for learners in isolation or as members of a group. Many educators even advocate varying the instructional unit size according to the content for learning, the instructional task and for different proportions of the school day.

To restrict the instructional plans that are labelled individualized to only those that attend to the instructional tasks for individuals, individually, would surely be controversial and would seriously jeopardize the credibility of the study's findings for the thousands of practitioners who frequently utilize small group settings and, yet, purport to be individualized. On the other hand, to ignore instructional unit size in defining individualized plans would surely invite confounding of individualization and standardization in this study.

An alternative would regard individualization and standardization as variable subcomponents of a composite called classroom instruction. This possibility has much merit, and we will attend to it under study questions two and three. However, if the study design is confined only to this alternative it will not be responsive to NIE's main question of interest.

Of course, it will also be said that consideration of instructional unit size is insufficient for determining "best fit" between learners and their instruction, and we must agree. Not only is the degree to which the instructional tasks are attended for learners individually important, but the kind of attention; ie., the level of attention that is given the instructional task for them is also important. Educators are just as divided on what level of attention is appropriate. Some argue that "best fit" is most effectively attained by preplanned highly specific attention; others are equally convinced that the learners are most likely to find their own best fit when they are free to discover their interest-related needs in relatively unstructured, broadly specified instructional contexts. Again, there are many who opt for eclectic mixtures of the two extremes. All of which further complicates the dichotomization of instructional plans into individualized and standardized categories.

It is our recommendation, therefore, that for purposes of question one, individualized instruction (individual or variable subgroup) and standardized instruction (class group) be defined in terms of instructional unit size only. This is an important dimension of task treatment, and consideration of its relationship to achievement and classroom climate will be appreciated by all practitioners who claim to be individualizing but who likely would be excluded by one or the other of more restrictive definitions. Special attention to questions of how the influence of instructional unit size and level of attention given to task treatment conjointly relate to outcomes will be taken up in questions two and three where the definition of program variables will be further elaborated.

Given that there are ten program variables and sites may be identified as either individualized or standardized on each task, a decision will need to be made as to how many tasks will require either an individualized or standardized rating for a site to be clearly qualified as either one type or the other. Ideally, sites should qualify for their classification on all ten tasks. Realistically, this may leave the follow-on contractor with insufficient sites to meet the requirements for analysis in one or both categories. If it is necessary to reduce the number of tasks required for qualification, we recommend that "responding," "feedback," and "monitoring" be successively removed from the qualification requirement until sufficient sites have been identified. While these are important tasks, they are probably equally subscribed to by both plan types, and may not be strong discriminators of the comparative programs in any event.

The RFP stipulates that the comparison of individualized and standardized plans on outcome effects be restricted to "well-implemented" plans of both types. For us, this means that the sites must initially meet the qualifications for their respective labels; i.e., be judged consistently individualized or standardized in their treatment (instructional unit size) of the instructional tasks (program variables). Ideally, sites should maintain their qualifications on task treatment across observations, over the course of the school year, to be considered well-implemented. In the event that too few schools retain their qualifications the contractor should establish a cut-off point (based on the quantification system described on page III-41 for qualification as well-implemented.

Sites that do not maintain their well-implemented classification need to be eliminated from the analysis for parts a and b of this question. However, not well-implemented sites will need to be included along with well-implemented sites to determine the relationship between degree of implementation and outcomes which is the requirement of part c of this question.

Observers will be trained to use the Instructional Task Treatment Observation instrument (ITTOF) to make moderately high inference judgments of individualized or standardized treatments of the instructional tasks. Observers will employ interview techniques with teachers and students, seek out and interpret appropriately indicative instructional materials and records and note their judgments of instructional unit size (individual, variable subgroup or class group) for each task. Instructional unit size of "individual student" or "variable subgroup" qualifies the site as individualized for the relevant task. To be variable requires provision for regrouping throughout the year. A "class group" judgment indicates standardized instruction. The strategy for scoring the ITTOF and the decision rule for labeling is treated in the data analysis section under this question.

Instructional programs, as we have narrowly defined them, operate in a classroom climate characterized by many interpersonal acts and their consequent effects upon teacher and student attitudes and feelings. Selection of sites for study under Question One requires that the sites meet minimal, at least, conditions of classroom climate that are deemed necessary for adequate program implementation. Soar and Soar have provided a small set of climate variables for screening purposes. The Classroom Environment-Screening (CE-S) instrument is discussed in the sampling and selection section under this question.

Outcome variables of interest in question one are as follows:

- Reading Achievement
- Mathematics Achievement
- Classroom Climate

Despite the dissatisfactions with standardized tests that have been voiced in many quarters, these tests, in lieu of adequate substitutes, are still relied upon by lay persons and educational administrators for assessment of learners' content achievement. Since the principal standardized tests have generally high reliability and validity, our principal concern in selecting a standardized achievement test was the degree to which the instrument would reduce the problem of "floor and ceiling" characteristics that severely limit the capacity of these instruments to reveal differential performances of many students whose actual achievement levels fall outside the grade-appropriate battery range.

The Comprehensive Test of Basic Skills (CTBS) and the California Achievement Test (CAT) are unique among standardized tests for their continuous scale scores across test levels which afford the opportunity to test students out-of-level. The standard administrations of these tests accommodate this option. We recommend that students be assigned to test levels on the basis of available scores and/or teacher judgment.

Our final recommendation of the CAT is influenced by the greater range of its Level 1 (2.0 - 4.9 vs 2.5 - 4.9 for the CTBS) and the substantially shorter period of time required for its administration (127 minutes compared with the CTBS' 176 minutes). Given that extensive testing already goes on in most schools, the substantially shorter testing time required by the CAT should help to enlist school cooperation for the study.

Additionally, we strongly recommend administration of sets of criterion-referenced test items, for reading and mathematics, selected by us from the pool released by the National Assessment of Education Progress Project (NAEP). Use of the subsets of NAEP items will significantly buttress the cognitive testing program in areas where the standardized tests are flagrantly weak. Some of the advantages to be gained are:

(1) NAEP items are tied directly to educational objectives.

(2) The objectives have been endorsed by scholars, educators, parents and other lay persons as important for youth to know and having value in modern life.

(3) The items are designed to be appropriate for a wide range of ages and span a wide range of difficulty levels. (The items are not chosen for their power to discriminate among respondents as are standardized tests items.)

(4) Performance data for NAEP-defined population subgroups and the national test population are available by item.

The NAEP descriptions of communities in which test respondents reside are particularly relevant for the compensatory aspect of this study. That is, the purpose of compensatory education is to close the gap between the educationally disadvantaged and the norm for all students. This is most meaningful at the community level. The NAEP identifies performances by geographic region, inner city, rest of city, suburban fringe, extreme rural, etc. The NAEP also reports for male and female and black and white races. To facilitate comparisons the follow-on contractor should describe the communities in which the sites are located in terms of NAEP criteria.

A performance data summary sheet supplied by NAEP, Congressional testimony of W. J. Popham on behalf of criterion-referenced testing, and the item subsets we have selected are included in the appendices.

Classroom Climate may be perceived as a process variable or as an outcome effect of classroom transactions. Techniques of Soar and Soar for assessing classroom climate over time have been notably effective, and it is planned that they should be used in addressing Questions Two and Three. However, we perceive climate as an outcome concern in Question One, and, since treating the Soar variables as outcomes would require assigning the same climate scores to each student (the unit of analysis), it makes more sense to us to use the My Class Inventory of Anderson and Walberg for this purpose. The MCI contains 45 items distributed over five scales: Satisfaction, Friction, Competitiveness, Difficulty and Cohesiveness. It is intended for use with 8-12 year olds who agree or disagree with each item. Although the individual scale reliabilities for MCI are not so high as the more thoroughly developed Learning Environment Inventory (LEI) from which it is adapted, they are relatively high (.54 to .77) for scales of this type used with children of this age group. It has been used successfully in a number of research studies and has been highly rated by several researchers. The instrument is included in the Appendix.

III. METHODOLOGY

A. STUDY QUESTION ONE

2. Sampling and Selection

This section includes a discussion of the sampling dimensions and sampling design for answering Study Question One. Also included are tested step-by-step procedures for selection and screening.

a. Sampling Design

i. Grade Selection- In order to increase the intensity of the study, the design is limited to a single grade level. The fourth grade is recommended for various reasons. First, the inclusion of grades beyond the fourth grade level would likely increase the complexity of the study by introducing another set of organizational arrangements such as different school grade grouping and differentiated staffing patterns. Secondly, grades below the third grade level would provide (1) minimal variance on the criterion achievement measures, (2) minimal opportunity for individualization to operate effectively, (3) minimal testing opportunity since very young children are not able to make the kinds of distinctions called for on some of the affective measures, and (4) little opportunity to make use of cost saving devices such as machine scorable answer sheets. The final decision between the third and fourth grades was coupled to our decision to recommend the inclusion of test exercises from the National Assessment of Educational Progress (NAEP). In order for the study sample to coincide with one of the NAEP sample groups the 9 year-old (fourth grade) group was selected.

ii. Primary Sampling Dimensions- Study Question One implies that content area (reading and/or mathematics), instructional type (individualized vs. standardized), and instructional settings (mainstream vs. separate groups) be used as primary sampling dimensions. Since the major purpose of the study is the comparison of the effectiveness of individualized instruction with that of standardized instruction, we regard the instructional type as the most basic of the sampling variables. Next in importance is the instructional setting variable. Finally, although comparisons across content area are not specifically called for in the study question, our reason for a sampling design that includes all possible variations is to investigate the possibility of transfer effects in the situation where only math or only reading are taught in one of the two instructional types.

That is, there are four possible combinations of content and instructional type. They are (1) both reading and math individualized, (2) reading individualized and math standardized, (3) math individualized and reading standardized and (4) both standardized. In the event that all cells, described below, can be filled the transfer of effect question can be investigated. (See below.)

	Math and Reading Individualized	Math Standardized Reading Individualized	Math Individualized Reading Standardized	Math and Reading Standardized	
Mainstream	8	8	8	8	32
Separate Instruction	8	8	8	8	32
	16	16	16	16	64

Along the *instructional type* dimension, both individualized and standardized instruction as well as various hybrid* types are expected to be identified. For this study question no hybrid types will be included.

Instructional setting has only two categories: mainstream and separate instruction. In attempting to define the categories we had to infer the reason for interest in the instructional setting. This we took as stemming from a concern for the possible negative effects that are likely to derive from labeling a learner as slow or different. The effect is believed to be associated with tracking (heterogeneous ability grouping) students into low ability groups, and/or labeling, in effect, students as special or different if they are "pulled out" of class for instruction. This interpretation calls for a definition of "mainstream" that describes conditions wherein labeling of any kind has been avoided and "separate instruction" as any condition that supports a "labeling" possibility.

We anticipate that instructional arrangements in the real world will make it difficult to differentiate "mainstream" from "separate instruction" and that math or reading instruction following on the "pull out" condition will make it difficult to categorize students as individualized or standardized. The following diagram has been constructed for purposes of definition.

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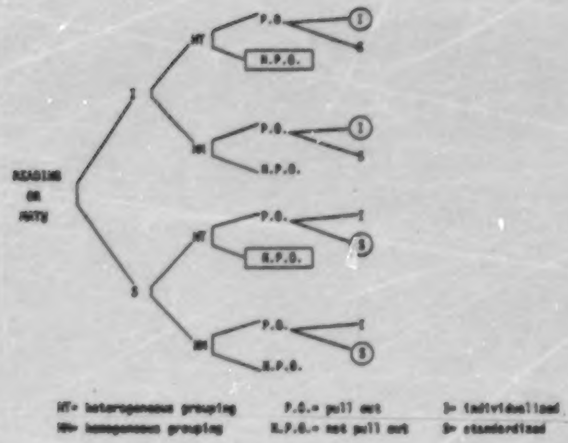
*Hybrid types have characteristics of both individualized and standardized instructions. See III-58 for a more complete definition.


READING
OR
MATH
I
S
HT
HM
P.O.
N.P.O.
I
S
HT= heterogeneous grouping
HM= homogeneous grouping
P.O.= pull out
N.P.O.= not pull out
I= individualized
S= standardized

We define "mainstream" as the condition wherein students have been assigned to a class on a heterogeneous basis and are not pulled out for special instruction, the $\boxed{\text{N.P.O.}}$ boxes are shown above. Ideally, treatment is mainstream only if it occurs in both content areas. All other conditions at the same level we define as "separate." Since "pull out" instruction can be either basic or supplementary and can be either individualized or standardized there is likely to be a problem in assigning students to the individualized or standardized instructional type. Because of this we have labeled those situations that we consider to be individualized Ⓘ and standardized Ⓢ where the pull out instruction is supplementary.

Thus, considering the combination of two content areas, two instructional types and two instructional settings there are 8 sampling points (cells) for a grade level as shown in Table III.1.

Table III.1

Sampling Cells for One Grade Level

	Math		Reading		
	I	S	I	S	
M	8	8	8	8	32
S	8	8	8	8	32
	16	16	16	16	64

iii. Sample size- In order to preserve the intense routine of the study, assure reliable information, and comply with economic constraints, we have recommended eight classes per cell be selected.

Unit of Analysis. Since it is anticipated that the students to be studied will be selected from the class group; i.e., the last stage of a multi-stage sampling procedure, we feel justified in suggesting that an appropriate unit of analysis is the student for Questions One a and One b. (Since One c deals with degree of implementation of a program, the classroom is the obvious unit for this analysis.)

Given the fixed budget and the N required for reliability, sampling at the class level would not be appropriate. Adequate power for the statistical tests can only be obtained in this design by using a smaller unit than the classroom for Question One, parts a and b.

iv. Control Variables- Variables to be controlled or partially controlled by selection are discussed in this section, variables used for statistical control are discussed in the analysis section.

Obviously, numerous variables are related to student outcomes in a variety of ways. It is patently impossible in an intensive study of this kind even to approximate an ideal experimental situation where adequate controls can be established or can be assumed. Therefore, it is extraordinarily important that all possible effort be spent in establishing comparable groups at the sampling stage. District educational policy and policy implementation; school SES in terms of percent of Title I students, racial composition, and per pupil expenditure are considered as variables controlled by selection.

Since pairs of classes, one individualized and one standardized, will be selected from a single district we will assume that district educational policy and policy implementation are satisfactorally controlled. In matching the class pairs, percent of Title I students, racial composition, per pupil expenditure, and level of urbanization must be considered as primary control variables. At the student level, students for whom English is a foreign language will be excluded from the analysis. Other variables that need to enter into the selection and matching decisions are discussed below under screening and selection.

b. Screening and Selection Procedures -

The intention of the screening and selection procedures is to identify for study purposes *well-implemented individualized* and *standardized* programs in *reading* and *mathematics*, employed in *compensatory* situations at the *elementary* level, used in either *mainstream* or *separate* settings that have demonstrated *replicability*.

Since this study is an intensive extension of the national NIE compensatory education study it is also considered desirable that the sample to be studied include sites identified for study in the District Survey I such that they comprise approximately 50% of the Survey II sample.

To meet these requirements adequately, it will be necessary to use multi-stage screening and selection procedures for the study. The steps to be employed in completing the screening and selection procedures are listed here and described more fully below. They are: (1) identification of candidate individualized reading and/or mathematics programs meeting the replicability and grade criteria, (2) identification of field work centers, (3) identification of compensatory individualized schools, (4) identification of comparable standardized schools, (5) screening sites on the implementation criteria, and (6) final selection of schools and/or classes for study.

Identification of Candidate Individualized Programs- There are several sources of information that have the potential of identifying individualized programs for study. Initially a search of the professional literature and commercial advertisements should be made. For the former, there are several suggestions. First, the NIE has recently (1975) completed a computer search on ERIC entries in the area of compensatory education and individualized instruction in reading and mathematics. Second, AIR (Wargo et al., 1971) has compiled two lists of descriptors from the Thesaurus of ERIC Descriptors (2nd ed.). The first set contains 40 descriptors "related to the education of children, preschool through senior high school." A modified version of the AIR descriptors should identify some individualized programs for the initial candidate pool. Finally, the NIE product catalog (in preparation), ALERT and EPIE will provide some information regarding individualized instructional programs.

For the commercial source, a telephone call to publishing houses advertising individualized programs at the elementary level in reading and/or math should serve the dual purpose of adding to the list of candidate individualized programs and securing nominees of sites qualifying as well-implemented either at the district or school levels.

Other potential sources of information include non-profit organizations known to be developers/producers of individualized programs, (e.g., Wisconsin R & D Center at the University of Wisconsin, the LRDC at the University of Pittsburgh, Research for Better Schools in Philadelphia, The Westinghouse Learning Corporation in New York City).

Organizations and professional groups known to be concerned with compensatory education programs should also be contacted and asked to submit a list of nominated individualized programs. Among those that might be contacted are: Compensatory Education Division Chiefs for the State Department of Education, State Title I Coordinators, the Office of Economic Opportunity, U. S. Office of Education, the National Laboratory on Early Childhood Education, the National Education Association, and the American Council on

Education.

Many of the sources specified above will, upon request, submit a list of programs and sites that use the individualized programs. The site information gained up to this point can be used to eliminate programs that do not meet the replicability criteria, (i.e., a program must be used in at least 100 classrooms or in two school districts). Programs also can be rejected at this screening stage if the content area is other than in reading or math and/or if the materials are not designed for the grade level called for in the study design.

Identification of Candidate Field Work Centers- As information is gathered identifying individualized sites, site lists should be compiled by subject area.

Final lists of schools using qualified individualized programs should be prepared listing sites by program by subject area. That is, there should be lists of nominated sites:

(1) for reading using program A, program B, program C, etc.

(2) for math using program A, program B, program C, etc., and

(3) for reading and math in a single site using program A, program B, program C, etc.

Since the study will be an intensive one requiring extensive on-site observations to be made over an extended period of time, it may be desirable to identify clusters of sites around several centers from which coordination of the field activities will be controlled. The "cluster" notion is discussed fully in the logistical section. If this course of action is followed, the sites identified above should be plotted on a map preserving program and subject area information. This visual aid should facilitate the selection of candidate field work centers. (See Figure III-1.)

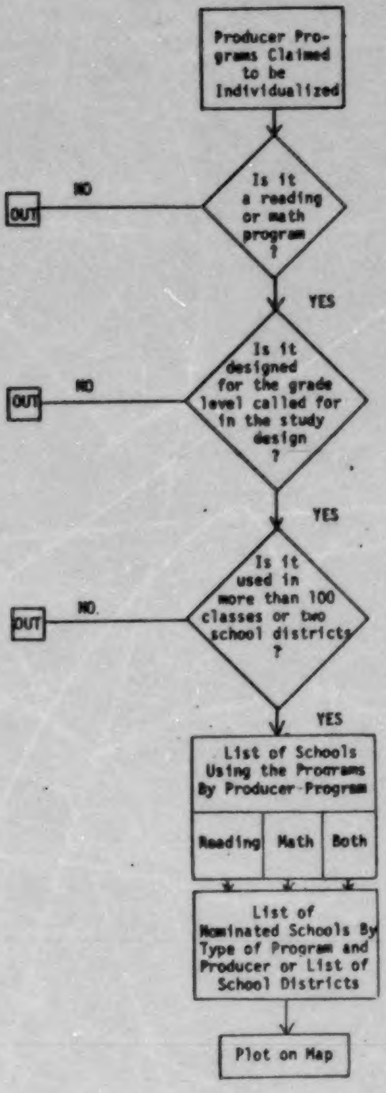

Producer Programs Claimed to be Individualized
Is it a reading or math program ?
NO
OUT
YES
Is it designed for the grade level called for in the study design ?
NO
OUT
YES
Is it used in more than 100 classes or two school districts ?
NO
OUT
YES
List of Schools Using the Programs By Producer Program
Reading
Math
Both
List of Nominated Schools By Type of Program and Producer or List of School Districts
Plot on Map

Figure III.1. Flow chart for program screening.

Identifying Compensatory Sites: School Districts- At this stage in the screening procedure the three lists contain the names of districts or of schools nominated as exemplary users of individualized math and reading programs at the appropriate grade level. The next step is to identify those among them that qualify as "compensatory."

There are two separate aspects to the "compensatory" dimension that need attention. First, the student group reached should be "compensatory." Since Title I schools are identified primarily to serve this student group, it seems expeditious to select schools from among this school group. Secondly, the individualized program must be used with the "compensatory" group.

It seems that an efficient selection procedure would screen out, at this stage, districts rather than school sites. For example if a district is not located within the specified distance from a field work center, or if a district has few compensatory students, the district should be eliminated, school sites need not be contacted.

It is recommended that initial contact be made with the district office in order to confirm the information regarding use, to determine whether or not sites are Title I schools, to determine whether or not there are other commercial or locally developed individualized programs in use in the district, and to request the nomination of comparable standardized sites for the individualized sites. (See Appendix for District Telephone Interview Form.)

Since it is most desirable to identify a set of comparable standardized schools within the same district for each of the individualized schools in order to control for variation in educational policy and policy implementation, nominations of standardized schools should follow identification of schools using individualized programs. The school district person should be asked to consider such criteria as similarity in terms of ethnic and racial composition, student mobility, percent of compensatory students, and per pupil expenditure in nominating a set of standardized schools for each of the individualized schools. (See Figure III.2.)

It will be necessary to complete screening on the "compensatory" dimension at the school level since the other aspect to be considered pertains to the use of the programs with compensatory students.

Identification of Compensatory Individualized Schools- The screening process for individualized schools and for standardized schools can be operated simultaneously. For reasons of convenience, however, they are discussed separately.

At this stage, information regarding the number of individualized classes in the designated grade level, grouping practices, instructional settings, should be obtained via a telephone interview with the school principal. The telephone interview should also be used to identify sites obviously not qualifying as either well-implemented individualized or well-implemented standardized.

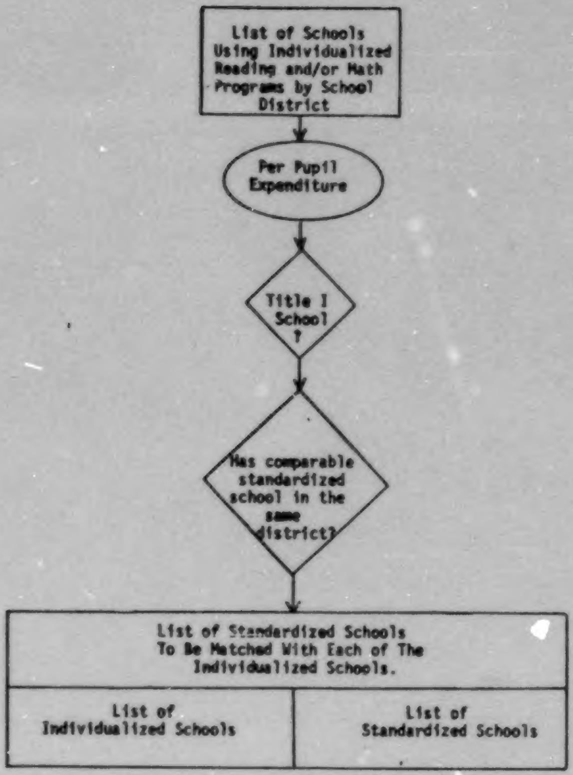

List of Schools Using Individualized Reading and/or Math Programs by School District
Per Pupil Expenditure
Title I School ?
Has comparable standardized school in the same district?
List of Standardized Schools To Be Matched With Each of The Individualized Schools.
List of Individualized Schools
List of Standardized Schools

Figure III.2. Flow chart for screening schools at School District Level.

The telephone interview form for obtaining the information identified above and for preliminary screening on implementation is called the Telephone Interview Form for School Principals. (See Appendix)

Identification of Standardized Schools- The procedures and forms for screening standardized schools are identical to those identified above. The major difference is in the criteria to be employed in deciding whether or not the standardized program is well-implemented.

It should be possible to eliminate at this stage schools not qualifying as either fully individualized or fully standardized.

Screening Sites for Implementation- On completion of the procedures described above, it will be necessary to visit the remaining candidate individualized schools and the set of schools nominated, within the district, as potential comparison standardized sites. The purpose of the visit is specifically the selection of classes for study but at the same time additional information should be gathered for making the final decision regarding the comparison pairs.

It should be recalled that the comparison of standardized programs with individualized programs is only a comparison of different ways of organizing for instruction. In either the individualized or standardized case, it will be necessary to eliminate from the candidate pool classrooms that do not have a desirable climate. Observations should be made on the screening device for classroom climate. (See Appendix for Classroom Environment-Screening.)

Final screening for program implementation should also be completed at this time. We recommend that this be done by means of an interview with the teacher regarding her classroom practice vis-a-vis the instructional tasks. (See Teacher Interview Form-Screening) The criteria specified for the observation schedule (ITTOF) should be used to eliminate programs not likely to qualify as "well-implemented" as the term has been defined.*

Other information at the school level that should be gathered for consideration includes (1) likely cooperation that the school staff will give the study group, (2) likely level of cooperation to be expected of the community and parent group, (3) likely conflict of study testing schedules with school, Title I, district, or state testing programs, (4) likely conflict with other ongoing compensatory education studies.

Final Selection of Classes for Study- If a school has more than one class in the target grade level, such control variables as the proportion of Title I students and racial composition should be considered in selecting study classes. Needless to say the instructional settings for each member of a pair of matched individualized and standardized classes should be the same.

For any class selected it will be necessary to determine that there are at least five (5) students who qualify on both an educational deficiency and a poverty criterion. (It is not clear which of the criteria is more relevant in terms of identifying the intended beneficiaries of compensatory funds.)

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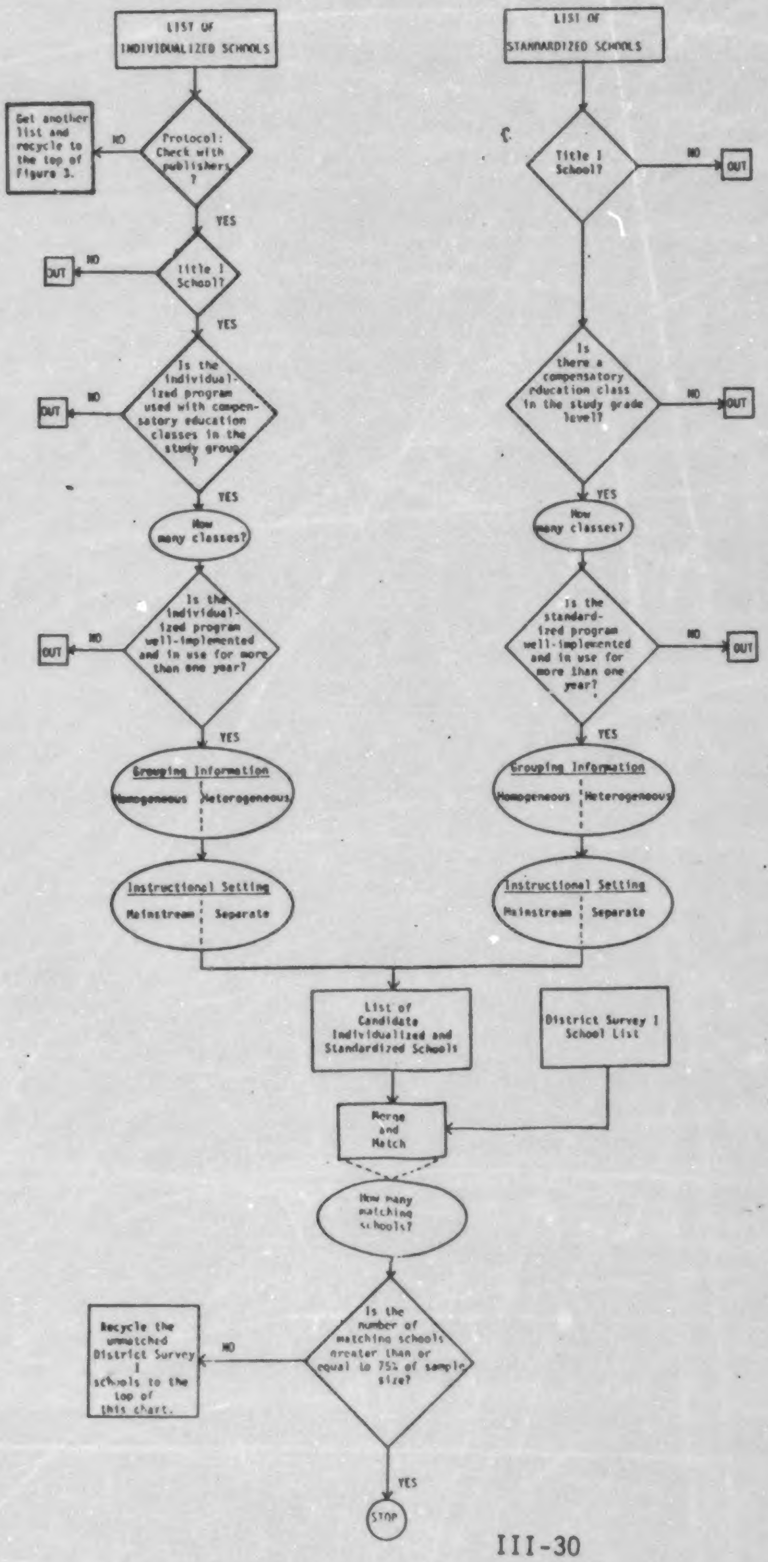
*See page III-9.

Finally, the schools selected should be merged and matched with schools from the District Survey I. Classes should continue to be selected until 150% (96) of the minimum sample size is reached, and the number of schools matched with District Survey I schools exceeds 75% of the minimum sample size. (See Figure 3.)

Figure III.3. Flow chart for school screening at school level


LIST OF INDIVIDUALIZED SCHOOLS
LIST OF STANDARDIZED SCHOOLS
Get another list and recycle to the top of Figure 3.
NO
Protocol: Check with publishers ?
YES
OUT
NO
Title I School?
YES
OUT
NO
Is the individualized program used with compensatory education classes in the study group ?
YES
How many classes?
OUT
NO
Is the individualized program well-implemented and in use for more than one year?
YES
Grouping Information
Homogeneous
Heterogeneous
Instructional Setting
Mainstream
Separate
Title I School?
NO
OUT
Is there a compensatory education class in the study grade level?
NO
OUT
YES
How many classes?
Is the standardized program well-implemented and in use for more than one year?
NO
OUT
YES
Grouping Information
Homogeneous
Heterogeneous
Instructional Setting
Mainstream
Separate
List of Candidate Individualized and Standardized Schools
District Survey I School List
Merge and Match
How many matching schools?
Is the number of matching schools greater than or equal to 75% of sample size?
NO
Recycle the unmatched District Survey I schools to the top of this chart.
YES
STOP

III. METHODOLOGY

A. STUDY QUESTION ONE

3. Data Collection Plan

As the section on study variables and instrumentation implies, data will be collected for the study from various sources during the study period using many different data gathering methods. On the following page is shown a classification of all the data gathering instruments for Study Question One. The study design calls for extensive observational data to be collected on classroom processes in addition to data to be collected by means of interviews, questionnaires, and tests administration.

a. Observational Data Collection

Classroom observations for this study question will be collected on the ITTOF to obtain an assessment of program implementation. The observations will be made by classroom observers specially trained for the purposes of the study and will, in general, be collected by a single observer recording data directly on specially prepared optical scan sheets. Approximately 30% of the observations will be made by a team of two observers for purposes of establishing the reliability of the data collected. In the cases of large open education classrooms, two observers will be used to make observations.

Table III.2. Instrument and Data Classification Scheme

Study Question 1

SOURCE	ANTECEDENTS	TRANSACTIONALS	OUTCOMES
Learner	Lorge-Thorndike Intelligence Test (LTIT)		California Achievement Test (CAT) National Assessment of Educational Progress (NAEP) My Class Inventory (MCI)
Teacher	*Student Data Collection Form (SDCF)		
Program	* Teacher Questionnaire- Screening (TQ-S) * Classroom Environment- Screening (CE-S) * School District Interview Form (SDIF) * School Interview Form (SIF)	Instructional Task Treatment Observation Form (ITTOF)	
Class			
School and Community			

*Data used for screening only

The program implementation observers will collect data during those parts of the day designated as being the primary time for instruction in the basic skills area. Observations for program implementation will be made over the entire school year so that it should be possible to identify any deterioration in implementation that may occur. During the observation visits, the trained classroom observers will use the ITTOF to record data reflecting direct observations of the instructional process, examination of various instructional materials including work completed by students and records kept regarding the type of instructional tasks observed. The observers will also examine student instructional materials prior to, during and following the class. These observations will focus on the scope of the curriculum opportunity and the specificity of the instructional objectives of the teacher. Informal questions asked of teachers and students will also enable judgment to be made about how each is attending to the instructional tasks during the specific class period observed.

All observational data will be forwarded on a weekly basis by the observers to the central facility of the contractor for appropriate processing.

b. Test Data Collection

All standardized tests such as Lorge-Thorndike Intelligence Test (LTIT), and California Achievement Test (CAT) as well as My Class Inventory (MCI) will be administered under standard conditions. LTIT will be administered in the Fall as a pretest.

CAT reading and mathematics tests will be given to the students in the study group in the fall and spring on a pre- and posttest basis. Only posttest data will be analysed under Question One. National Assessment of Educational Progress (NAEP) exercises which are criterion-referenced tests and MCI will be given in the spring only.

All tests will be administered by trained test administrators in the presence of classroom teachers in order to control test administration conditions.

Specially designed optical scanning answer sheets will be used to reduce coding and keypunching errors and to facilitate the data processing.

III. METHODOLOGY

A. STUDY QUESTION ONE

4. Data Analysis Plans

In this section we describe all tasks and procedures that are involved in data analysis from the first stage of receiving data from the field to the last stage of producing (printing-out) the final analysis results. A general outline of these procedures is shown below, and step-by-step procedures are discussed in subsequent sections.

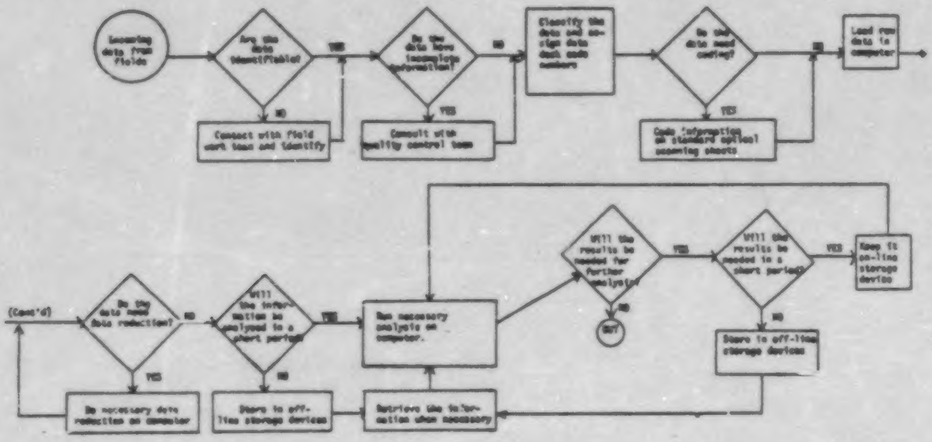

Incoming data from fields
Are the data identifiable?
YES
NO
Contact with field work team and identify
Do the data have incomplete information?
NO
YES
Consult with quality control team
Classify the data and assign data deck code numbers
Do the data need coding?
NO
YES
Code information on standard optical scanning sheets
Load raw data in computer
(Cont'd)
Do the data need data reduction?
NO
YES
Do necessary data reduction on computer
Will the information be analyzed in a short period?
YES
NO
Store in off-line storage devices
Run necessary analysis on computer.
Retrieve the information when necessary
Will the results be needed for further analysis?
YES
NO
EXIT
Will the results be needed in a short period?
YES
NO
Keep it on-line storage device
Store in off-line storage devices

Figure III.4 Flow Chart for Data Management, Data Processing, and Data Analysis

a. Data Management

Data management procedures followed for this study include check in, editing and quality control, coding, optical scanning and data cleaning; all designed to improve the accuracy of the data. Data classification, record keeping and filing systems will need to be maintained so that the data files can be continuously updated and that information which may be needed by the principal investigator or by other research personnel can be readily retrieved at any stage of processing operation.

i. Check-in-- The check-in system would operate so as to monitor the receipt of data from the field so that close control may be kept over both individual interviewer's workflow and overall study milestones. Trained clerks will check in all data sets, verify that data are identifiable, contain complete identification information, check for completeness, classify the data, assign data set codes, and keep daily and weekly tallies required for completion reports.

Because of the size and complexity of this study, a computerized logging-in system may be used to supplement check-in procedures. Here, essential call report information would be keypunched daily and linked in the computer with a file containing the total sample. Weekly completion reports may then be generated with breakdowns needed for assessing study progress within particular sample sub-populations.

ii. Editing and Quality Control- After data are checked-in, every completed form will need to be reviewed by an editor who is supervised by a quality control staff. Editors should be trained in both classroom observation and testing procedures and should attend a training session for this study.

The quality control staff will work closely with other research departments and early in the fieldwork period provide feedback about any problems with the interview or observation schedules that may require clarification of instructions. During this same period, the first interview conducted by each interviewer will need to be checked carefully; the quality of this first interview should be approved by the fieldwork supervisor before the interviewer is permitted to continue with a field assignment.

In reviewing a completed questionnaire, the editor may find that certain responses need clarification or that the interviewer has misunderstood instructions or has omitted essential questions. In such cases, an explanatory memo would be sent to the fieldwork supervisor and to the interviewer with copies of the questionnaire pages where the problem occurred. When necessary, the interviewer would be instructed to contact appropriate school personnel to obtain the missing information.

iii. Data Classification System- Since data for this study will be collected from many sources the levels of data reduction are expected to be different for different types of data and for different purposes.

For convenience, we propose that a two-dimensional layout for data classification be used: (1) data source and (2) time of the data collection. The data sources should be broken down to (a) student level, (b) class level, and (c) community level. Data will be also classified into (a) antecedents, (b) transactionals, and (c) outcomes data according to the time the data were collected and/or intended use of the data. The data that would be collected for this study question are tentatively classified into such a two-dimensional classification system. (See Table III.1.)

iv. Data File Management- With various types of data from many sources arriving at different times, there will be a need for a good data filing system. This system should allow for easy, efficient storage and retrieval of raw data via computer.

On a weekly basis the "new" data should be merged with the "old." All data-- both new and old-- should be partitioned and stored according to the classification scheme indicated above. All data will be stored on magnetic tape with disks used during the merging process.

The merging process will involve: (1) writing each old data set from tape to disk, (2) adding the new data to their respective data sets, and (3) writing each data set back to tape from disk. All of this will be completed by a user-written computer program that flags the beginning and ending disk tracks off each data set.

b. Data Reduction and Transformation

The level of data reduction will vary with the source of data and with the unit of analysis for the study question. Since the unit of analysis for Study Question One is a compensatory education student, these students' outcome data should be scored for each student when the data files are completed.

This design has recommended the use of the California Achievement Test- Reading (CAT-R, posttest), California Achievement Test- Mathematics (CAT-M, posttest), National Assessment of Educational Progress Test in Reading (NAEP-R) and NAEP test in Mathematics (NAEP-M), and the My Class Inventory (MCI) as student outcome measures in answering Study Question One.

Student files- Data should be stored in three separate files, by student. The three files should contain data for students meeting (1) only the educational deprivation criterion, (2) only the poverty criterion and, (3) both the educational and poverty criteria. The student data filed will be individual SES, I. Q., test scores, and information identifying the sampling cell to which the student belongs.

All files will need to be checked for completeness with regard to the criterion in question. That is, for students meeting only the education deprivation criterion and students meeting both criteria the contractor will need to check for I. Q. data. The absence of I. Q. data in this instance should eliminate that student from the analysis. For students meeting only the poverty criterion and students meeting both criteria a check will need to be made for SES data. Students will be dropped in this instance if SES data are missing. Students whose data are in the third file should be those who qualify on both criteria, SES and IQ.

Scoring- Students' achievement test item data on the California Achievement Test (CAT), and National Assessment of Educational Progress exercises (NAEP), and intelligence test data at this stage has been stored on tape from the optical scanning process. The student's CAT subtest and total raw scores will be converted into Achievement Development Scale Scores (ADSS) by using national norm tables. A subroutine program for converting CAT raw scores to ADSS should be used.

When the criterion-referenced exercises (National Assessment of Educational Progress exercises) are scored, they will be classified into appropriate size and community groups according to the NAEP classification scheme. The item analysis procedure used should provide for each exercise the proportion of students who selected the correct answer(s). It is this proportion that will be used in the comparison stage.

The measure of classroom climate (My Class Inventory) will be scored for each of the five scales by summing positive responses.

The Lorge-Thorndike item data will be converted by using norm tables. A subroutine will be needed for this purpose.

The degree of implementation data that is needed to answer Study Question One part c will be derived from the data collected on Instructional Task Treatment Observation Form (ITTOF) during the study period in the following way: (1) assign value 1 for each instructional task treatment practice if it is consistent with the definition (that is, if the instructional event occurred in an individualized way in individualized classes and in a standardized way in standardized classes), and otherwise assign 0; (2) add these points across the ten essential instructional task treatments and across the entire series of observations; and (3) convert the sum into a percent. This data reduction procedure will be easily handled with the TRANSFORMATION program in SOUPAC (Computing Services Offices of University of Illinois, 1974).

For example, if there were 5 essential task treatments and 6 observations were made in an individualized classroom the observational data might look like those shown below in the following tables:

	Observation 1	Observation 2 . . .	.Observation 6
Task 1	Ⓘ S	Ⓘ S	I Ⓢ
Task 2	Ⓘ S	Ⓘ S	Ⓘ S
Task 3	Ⓘ S	Ⓘ S	Ⓘ S
Task 4	I Ⓢ	Ⓘ S	Ⓘ S
Task 5	Ⓘ S	Ⓘ S	Ⓘ S

4 points + 5 points + ... + 4 points = sum (27)

$$\text{Percent} = \frac{\text{Obtained Sum}}{\text{Possible maximum sum}} \quad \text{X } 100$$

The degree of implementation index for this class will be 90.

$$\frac{27}{30} \text{ X } 100 = 90\%.$$

In the event that deterioration is very high over the course of the year it may be necessary to establish a cutting point such that an adequate number of sites are retained for the primary effectiveness comparisons. The contractor will have to decide on a cutting point for identifying well-implemented programs for Study Question One part a and b. What the cutting point should be cannot be specified at this time since there is no way of knowing what the distribution of implementation scores will be.

c. Analytic Procedures

In answering Study Question One, we recommend that analyses be performed based on three different criteria for identifying compensatory education students: (1) a poverty criterion (e.g., SES), (2) educational deficit criterion (e.g., educational achievement), and (3) both poverty and educational deficit criteria. The following analytical procedures for question one will be employed for all three groups identified by these three criteria.

First, there is a need to consider sampling bias prior to analyses. Matched samples are often used to reduce bias in non-randomized studies such as the present one. Unfortunately, it is likely to be difficult to obtain satisfactorily matched samples. An alternative is to make statistical adjustments after the samples have been drawn. We would recommend that the uncontrolled effects of confounding variables such as SES, I.Q., etc., be partialled out by treating confounding variables as covariates in an analysis of covariance design.

In order to investigate the relative effectiveness of individualized vs standardized instruction and mainstreamed vs separate instructional settings, we recommend a 2(program) x 2(setting) factorial design employing univariate and multivariate analyses of covariance on reading, mathematics and student perceived classroom climate. It is possible that there will be program transfer effects either carrying over from reading to math or from math to reading. Four different instructional groups may be easily identified as (1) individualized instruction for both reading and math, (2) individualized instruction for reading but standardized for math, (3) standardized for reading but individualized for math, and (4) standardized for both reading and math. We recommend that transfer effects be investigated using the same 4(combination of instructional type and content) x 2(instructional setting) analytic scheme.

Since we believe that program effects are cumulative, posttest achievement scores instead of residual gain scores should be employed as the dependent variables in this analysis.

We recommend that univariate analyses be performed on both the CAT subtest scores and total scores of reading and math, and NAEP reading and math total scores, and student perceived classroom climate (MCI) factor scores separately. Multivariate analyses should be run for: (1) the four CAT subtest scores (vocabulary, comprehension, computation, and concepts and problems), (2) CAT reading total scores, CAT math total scores and student perceived classroom climate, and (3) NAEP reading and math total scores and student perceived classroom climate. In the univariate cases, a priori planned multiple comparisons or Duncan's multiple range comparisons need to be performed for those contrasts showing significant differences; while in the multivariate cases, discriminant analyses will need to follow those contrasts showing significant differences.

In order to investigate the relationship between instructional types and student outcomes and between instructional settings and student outcomes, Hay's (1973) OMEGA square (W^2) will be computed for univariate cases, and Tatsuoka's (1971) multivariate version of OMEGA square for multivariate analyses.

Either MANOVA (Multivariate Analysis of Variance) or MULTIVARIANCE (Univariate and Multivariate Analysis of variance, covariance and regression), or SOUPAC (Statistical Oriented Users Programming and Consulting) can be used for these analyses. One hypothetical table is shown as follows:

Univariate Analysis of Covariance Table

Source	SS	DF	MS	F
Programs	444.0	3	148.0	5.67
Settings	146.0	1	146.0	5.59
Programs x Settings	24.0	3	8.0	0.31
Error	939.6	36	26.1	

DISCRIMINANT ANALYSIS

Mean Scores and Standard Deviations

	Group 1 (M)		Group 2 (S)	
	Mean	SD	Mean	SD
Var.				
VCBL	25.30	2.80	20.20	2.90
CMHS	21.30	3.40	18.90	3.10
CMPT	30.25	5.01	25.51	4.50
CPPM	27.38	4.85	23.48	4.30

Function 1

Coefficient		Standardized Coefficient	
VCBL	1.25	VCBL 1	0.35
CMHS	0.89	CMHS 2	0.12
CMPT	3.80	CMPT 3	0.84
CPPM	4.50	CPPM 4	0.72
Constant	4.57		

If the contractor has serious reservations about use of the analysis of covariance we recommend regression adjustment (Cochran and Rubin, 1974) as an alternative in which the treatment effects are adjusted by the regression of the dependent variable on the confounding variables. In this case, Hotelling's T^2 and Student's t-test would be used to test the adjusted treatment effects-- standardized vs individualized and mainstreamed vs separate instruction for multivariate and univariate analysis respectively.

To answer Question One part c, the outcome data of students in not well-implemented classes will be restored.

The relation between student outcome variables and the degree of program implementation will be investigated via a correlation approach. It would be desirable initially to determine whether any of the relationships are non-linear. The analysis of variance test for non-linearity (H. M. Blalock, 1960) can be employed to determine the proportion of variance explained by the linear model and to test the significance of additional amounts of variance explained by the non-linear model. If there is a non-linear relationship between achievement measures and the degree of implementation variable, some transformations (e.g., square root, logarithmic, etc.) should be made prior to analysis. Pearson's product moment correlation coefficients between students' achievement scores and degree of program implementation indices will be computed for individualized and standardized instructional groups, separately.

III. METHODOLOGY

B. STUDY QUESTION TWO

1. Rationale for Selection of Variables, Definitions and Instrumentation

We are not confident that direct comparison of groups of classrooms labeled individualized and standardized will disclose any significant differences on achievement or climate outcomes because of confounding of treatments. Thus, we recommend investigation of the differential effects of differential treatments of instructional tasks across all classrooms. This does not mean that individualization and standardization are to be ignored; rather, we recommend study of the conjoint effect upon outcomes of the degree of individualization and level of attention given to the instructional tasks by classroom without regard to any global classification of that classroom.

Moreover, since it has been argued that classroom climate interacts with instructional treatments with consequent impact upon cognitive and affective outcomes, we recommend that the nature of these relationships be studied.

Based upon the concerns noted above, we recommend the second set of major study questions.

a. *How does specificity of treatment of the instructional tasks, taken one at a time and in sequential combinations, relate to cognitive and affective outcomes?*

b. *How does specificity of treatment of the instructional tasks taken together with classroom climate relate to cognitive and affective outcomes?*

The variables of major concern under this set of questions are:

Program Variables
Classroom Climate
Reading Achievement
Mathematics Achievement
Student Perceived Climate
Student Attitude Toward Reading
Student Attitude Toward Math

Program variables under this question consist of the same ten instructional tasks discussed under question one. However, while the tasks varied in terms of instructional unit size under question one, task treatments under question two, will vary in terms of the specificity of their treatment which is defined in terms of coordinate descriptions that reflect (1) instructional unit size and (2) level of attention given to the task.

The reason for this bidimensional concept of task treatment derives from concern that differential treatments of instructional tasks within individualized and standardized groups have washed out potentially significant differences when outcome effects are aggregated for program types. If significantly different outcome effects are to be found, they will be associated with instructional practices in the classroom without regard for labels.

While educators are ambivalent with respect to whether or not individual students can be best attended individually or as a member of a group, as was mentioned under question one, they are equally divided on the level of attention given to instructional tasks that will most likely lead to highest achievement. One group tends to be determinist; i.e., they believe that, given the antecedent conditions, instructional sequences can be specifically planned and arranged so as to lead the student to predicted outcomes. Instructional task treatments in this case tend to be detailed and structured, i.e., highly specific.

Another group of educators tends to be phenomenalist, given to the veiw that learning is a unique experience in time and space and a function of the stage of development of the learner. This group is committed to open and relatively unspecified learning environments. They count upon a natural propensity of humans to learn according to their respective interests, needs, stages of development and circumstances. Between the two groups are those who pursue eclectic mixtures of instructional task treatments employed by the determinists and the phenomenalists.

To generalize an answer about "the relative effectiveness of individualized instruction vs standardized instruction" would be meaningless considering all the permutations and combinations of organizational arrangements and instructional task treatments that would be subsumed under the labels, individualized and standardized. We perceive one way of categorizing the variety of instructional conditions with respect to task treatment to be as follows:

	Instructional Unit Size		
Level of Attention	Individual	Variable Subgroups	Class Group
Specific	9	8	3
Eclectic	7	6	2
Unspecified	5	4	1

The ordinal numbers appearing in the cells indicate an order of specificity of attention to the instructional tasks, from least (1) to most (9). Such matrices can be used to describe the specificity conditions for each of the bi-dimensional instructional tasks.

Provision of Curriculum Opportunity- Appropriate matches of learners with instruction are dependent, in part, upon a curriculum that permits initial placement of each learner on the basis of his/her entering achievement level and provides sufficient scope to accommodate the potential progress of the most advanced learner. The following matrix describes the specificity conditions for the opportunity task. It indicates that the opportunity that will most specifically accommodate the unique placement and progress needs of learners occurs when the scope is three-or-more grade levels and placement is to be made for learners individually.

	CURRICULUM OPPORTUNITY Opportunity is provided for:		
Level of Attention	Individual Learners	Variable Subgroups	Class Group
3 or more grades	9	8	3
2 grades	7	6	2
1 grade	5	4	1

Statements of Curriculum Intentions- Deliberate matching of learners with instruction and evaluation of their performance can be most specifically attended when statements of curricular intention are expressed in terms of content behaviors expected of learners individually.

Deliberate matching of groups of learners with instruction and serendipitous matchings of individual learners with instruction according to their discovered needs or interests may be best accommodated when curricular intentions are expressed as broad goal statements, relatively unspecified.

	STATEMENT OF CURRICULUM INTENTIONS For:		
Level of Attention	Individual Learners	Subgroups	Class Groups
Pupil Content Behaviors	9	8	3
Content Offerings	7	6	2
Broad Goal Statements	5	4	1

Curriculum Placement Decision- Instruction likely will be more effective the more appropriately the learner is placed into the curriculum on the basis of the learner's competency and need. Since the appropriateness of placement relative to the learner's actual competency and need is a very high inference task for observers, we propose that the appropriateness of placement be judged upon the basis of the placement decision conditions.

Deliberate placement of learners will be most specifically accommodated for individual students to the extent that their competencies and needs can be described in terms of their criterion-referenced performances. Less specific judgments of teachers and learners provide more latitude for learners to find their own entry points into the curriculum. Deliberate placement of groups on the basis of grade level expectations are probably least specific with respect to the competencies and needs of the learner.

	PLACEMENT DECISION CONDITIONS For:		
Level of Attention	Individual Learner	Subgroup	Class Group
Criterion-Referenced Performances	9	8	3
Judgment	7	6	2
Grade Level Expectations	5	4	1

Adjusting Rate of Instruction- Rate of instruction should be directly related to the rate of acquisition of the learners whether controlled by the teacher or the learner. Since learners differ markedly in their rate of acquisition, the rate likely will be more specifically appropriate to the individual the smaller the group for which it is adjusted.

	Individual Learners	Subgroups	Class Groups
Rate of Instruction	3	2	1

Provision for Individual Responding- Opportunities for responding can be provided for groups and can vary widely in terms of the degree to which the opportunity can be made specifically appropriate to the needs of the learner. However, response opportunities are typically made available to individuals, even in group-paced contexts, and since judgments of appropriateness must be very high inferences, we recommend frequency of occurrence be the dimension of variation for this task. If two-thirds or more of the class are provided response opportunities in any given session this should be considered high frequency, one-third to two-thirds would be considered moderate; and one-third or less low.

Provision for Individual Feedback- Feedback, as with responding, is most often made available for individual assistance and also requires high-inference judgments as to its appropriateness for the individual, therefore we recommend the same frequency measure as for responding.

Monitoring Individual Progress- Monitoring of individual student progress can take many forms and is difficult to judge. We recommend the same frequency measures as for the previous two tasks.

Performance Standard for Advancement- Standards will more likely lead to performance consistent with curricular intentions when the standard is specific to the intentions, absolute for each learner. Variable standards for individuals and groups will be less specific with respect to intentions and no standards are apt to apply when only broad goal statements exist.

	PERFORMANCE STANDARD FOR ADVANCEMENT For:		
Level of Attention	Individual Learners	Subgroups	Class Groups
Absolute	9	8	3
Variable	7	6	2
No	5	4	1

Evaluation of Performance- Program prepared tests are apt to provide the most specific basis upon which to judge performance relative to curriculum expectations, and the evaluation will be most specific for the individual the smaller the group being evaluated. Judgment of teachers and/or learners likely will be least specific with respect to the curriculum and large group evaluations least specific with respect to the performance of individuals.

Matching Learners with Next Instruction- The reasoning associated with the matching of learners with instruction is nearly identical with that for the placement decision. Criterion-referenced performances provide the most specific information with respect to learner competencies and needs and automatic matching of learners with next instruction in the standard sequence is least specific relative to learner needs. The smaller the group being matched with the same instruction the more likely the matching will be specifically appropriate for the individual learner.

Classroom Climate Variables- Question Two requires an extensive study of classroom climates and the relationship of various climates with changes in class achievement that will occur during the period of the school year. Soar and Soar have done notable work in this area and have developed a set of instruments that have proved effective and reliable in discriminating among climates.

The instruments proposed for the measurement of classroom environment are the Florida Climate and Control System (FLACCS) (Soar and Soar, 1973), and the Teacher Practices Observation Record (TPOR) (Brown, 1968). In earlier work in Follow Through, both instruments demonstrated adequate reliability, and discriminated at statistically significant levels between programs in the Follow Through Planned Variation studies.

Since the proposed study will examine individualization vs standardization and mainstream vs separate instruction, it seems likely that a different set of factors would emerge from analysis, so that a specific set of factors is not proposed here but will be derived. The kinds of behaviors which are recorded by the two instruments are as follows:

FLACCS- Teacher control of pupil behavior, ranging from gentle and unobtrusive to harsh and coercive, both verbal and non-verbal; pupil response to teacher control (disruptive behavior, orderliness and a global measure of task involvement); pupil assumption of responsibility; teacher affect expression (positive and negative, verbal and non-verbal); pupil affect expression (positive and negative, verbal and non-verbal); classroom structure (number and size of groups, with or without an adult); degree of attention by adults to individual pupils; and pupil freedom of movement.

TPOR- Is the teacher the center of attention or is the pupil; is the pupil actively involved, or waiting, watching, and listening; is the pupil at work on a teacher-set task or his own; is the subject matter task clearly focused and restricted or is the pupil encouraged to go beyond this; is only one answer acceptable or are alternatives accepted; does the pupil support his answer with evidence; who evaluates; and is motivation extrinsic or intrinsic?

Outcome Variables- Since an interest of Question Two focuses upon the relationship of climate factors and instructional task treatments with cognitive outcomes, the CAT, selected to be administered as a posttest for Question One, will also be administered as a pretest here in order to provide the necessary gain scores for the analysis. The CAT was discussed under Question One.

A second interest under Question Two is the relationship of climate and instructional task treatments upon non-cognitive outcomes. As with question one, we recommend My Class Inventory to assess student perceptions of classroom climate. The MCI was also discussed under Question One. Along with student perceptions of classroom climate, it is of interest to know how the students' attitude towards reading and math relates to various classroom climates and instructional treatments. The How I Feel instruments have been selected for this purpose.

HIFAR and HIFAM are designed for the measure of student attitudes toward reading and math, respectively. Continuous use and revision of these instruments for formative and summative evaluations of RBS' individualized instructional programs have shown that these instruments can be readily administered to fourth grade students. Internal consistency coefficients for recently revised versions of these measures were all above .80.

III. METHODOLOGY

B. STUDY QUESTION TWO

2. Sampling and Selection

a. Sampling Design

All of the primary sampling dimensions for Study Question Two are the same as those for Study Question One (See Section III A.2.) with one exception, an additional level of instructional type that we will call the hybrid case. The hybrid case is defined as a classroom operating with mixed characteristics on the set of instructional tasks as they have been defined for identifying individualized and standardized operating programs.

Inclusion of the hybrid cases as an instructional type will increase the number of levels of combinations of instructional type with content by five. They are:

(1) both reading and math are hybrid,
(2) reading is individualized - math is hybrid,
(3) reading is a hybrid - math is individualized,
(4) reading is standardized - math is a hybrid, and
(5) reading is a hybrid - math is standardized.

This will increase the total number of sampling points by ten with 4 classes per cell. This increases the total sample size by 40 classes thus the total number of classes is 104. (See Table III.3.)

Unit of analysis- For Study Question Two we propose to use the class as the unit of analysis since we are studying the effects of process variables on the student group as a whole.

Table III.3

Additional Classes to be Sampled for

SQ 2 & SQ 3

	BH	R-I, M-H	R-H, M-I	R-S, M-H	R-H, M-S	
M	4	4	4	4	4	20
S	4	4	4	4	4	20
	8	8	8	8	8	40

3. Data Collection Plan

The data collection plans for the major portion of the data have been described above (see Section III A.3.) with a single exception. For Study Question Two we have recommended use of the SOAR observational systems for classroom climate. The special conditions under which the proposed observations would be made require consideration of a number of alternatives particular to the observations required for assessing classroom climate that are discussed below.

Rationale for Making the Full School Day the Unit of Observation for Classroom Environment - It is clear that observation of the instruction of reading and math would be required as a part of the research design in order to test the effects of program and setting on classroom environment. Whether the research design requires observation of more than reading and math periods is less clear. For a number of reasons, we propose observing for the entire school day, keeping separate the observations for instruction during reading and math. This would contribute to the strength of the study in several ways. First, it would provide information about the integration of the compensatory program with non-compensatory activities (for example, does the presence of individualization for one subject matter increase or decrease time spent on other instructional activities?). It would provide information on the broader effects of individualization on the classroom environment (for example, if individualization of reading is associated with a warmer emotional climate, does that increased warmth carry over to the remainder of the school day?).

Beyond these reasons for observing the full day, there is the broader question of whether learning in reading, for example, is only effected by the activities that occur during reading instruction. Conventional wisdom suggests that this is not true. A teacher may, and probably does for example, teach reading during social studies or other activities. Further, it seems likely that the effects of environmental variables present during the remainder of the day would carry over to reading instruction. The pupil's experience for the entire day probably affects his liking for school and the teacher, and these attitudes in turn probably modify specific subject-matter achievement.

In addition to the beliefs cited above, there is some evidence for collecting observation data throughout the day. Several studies indicate that pupil achievement gain is greatest in classrooms where an intermediate proportion of activities are set by the teacher and that there is less pupil gain in classrooms where there is either a greater or lesser proportion of teacher-assigned activities. (Soar, 1968; Coates, 1970; Soar and Soar, 1972, 1973; Brophy and Evertson, 1974). If this is so, then it seems possible that the effect of whatever amount of teacher task assignment may occur under individualized instruction may be moderated by the amount of teacher assignment of task which occurs during the remainder of the school day.

A final consideration in this recommendation is that collecting observational data for the full day would be little more expensive than observing only during the time set aside for instruction of reading and math, since teaching of reading and math will be concentrated in the morning hours in most classrooms. Consequently, observing only those subject-matters would make poor use of observer time. Full-day observation would ease difficult scheduling problems.

Rationale for the Proposed Data Collection Procedures - A review of the instructional patterns likely to be encountered in classrooms in the proposed project indicates that they are much more complex and variable than has been true in past research utilizing classroom observation. The norm in past studies has been to use either self-contained classrooms in elementary school, or a single subject-matter or even a single brief unit of instruction in secondary school. In all cases, a given group of pupils was associated with a single adult or team of adults during the period of the study. In contrast, the classrooms to be studied in this project represent varied and complex instructional patterns in which different teachers are responsible for varying portions of the total instructional time for a group of pupils. An adequate degree of reliability of the observational measures is sought for each portion of the day for which a different teacher is responsible, but the data still must be aggregated to represent the instructional experience of the typical child, both for reading and math, and for the entire day. This complexity presents formidable problems in obtaining adequate reliability, only one of which is the geographic separation of the sites which makes additional visits to a classroom expensive.

Reliability of Observations in Reading or Math vs. the Entire Day vs the Reliability of the Total Study- In past research using these instruments, adequate reliability and highly **significant** discriminations between programs were obtained using twelve five-minute observations for a total of 60 minutes of class time, recorded by each instrument across two observers and one classroom day. The basic data collection process proposed for this study would have 36 three-minute observations for each instrument across two classroom days and one observer, supplemented by one additional day's observation with two observers, for a total of 108 minutes of class time. In terms of past experience, this would appear to be adequate for reliability purposes.

However, for the observations in reading or math, if we assume an instructional period of approximately 45 minutes, eight observations of 3 minutes each would record 48 minutes of instructional time across two days and two observers. This, then, would be half as many observations and between a quarter and a third as many minutes as demonstrated adequate reliability for the full day in previous work. Although these amounts seem small, we suspect that the number of observations is more important to reliability than the number of minutes recorded, within limits, and that classroom behavior within the instruction of a single subject matter is probably less variable than across the classroom day, so that a smaller amount of data should be adequate to establish reliability although it would probably be lower than for the entire day.

But these are trade-offs inherent in the situation. The expense of collecting observational data will be a major item of the budget, and will to a considerable degree set the sample size. If the same level of reliability is sought for the observation of reading instruction which would ordinarily be sought for an entire day's observation, the additional days of observation required must decrease the sample size. As an example, the trade-off then is between more reliable observational data for reading, or a larger total sample.

For the self-contained classroom, the decision which has been made here has been to seek a full day's observation by one observer on three separate days for each classroom supplemented by an additional observer on the third day and accepting lesser reliability for lesser segments of instruction in math and reading. While this is not easy to accept, the alternative appears to be to an unacceptable reduction in sample size. Several other considerations enter into this trade-off. Description of an individual classroom with the precision which would be important to the evaluation of an individual teacher does not seem necessary; rather, what is required is the accumulation of data which, when aggregated across classrooms, will discriminate between programs or settings, or identify concomitant variance so as to reduce error in prediction. Furthermore, there is some evidence (Brophy and Evertson, 1974) which indicates that reading gain is predicted as well by observation for the total day as by observation or reading instruction alone, although there were suggestions that word discrimination gain may have been more closely associated with observation or reading than total day observation. (Whether individualization occurred in the classrooms in that study is unknown, but it was carried out partially in Title I schools.)

Another part of the rationale for not seeking additional observations for reading and math for teachers in self-contained classrooms is the expectation that the classroom environment created in reading and math will have considerable similarity to that created by the teacher for the remainder of the day.

The general plan of data collection is one in which observers would be trained during the fall, either in the format of a typical university course or in an intensive two-week workshop. The training would include study of written material, lecture-discussion class activities, observation of video-tape with critiqueing, and increasingly frequent live observation in classrooms with critiqueing. Following training, observation of classroom environment would take place mid-year, probably between January and March, with regularly scheduled periods for reliability checks and retraining.

The self-contained classroom is the simplest situation and the one which will be used as a reference point in identifying procedures to be followed in more complex settings; but as the number of teachers involved in instruction of a pupil group increases, the number of observations required for adequate reliability will increase.

Procedures for Collecting Data for Classroom Environment - A number of patterns for organizing instruction are anticipated and the data collection process and the aggregation of data for estimating reliability will need to differ to accommodate these different schemes.

As stated earlier, the simplest case would be the self-contained classroom, either individualized or standardized, mainstreamed or separated, in which all pupils spend the day with the same teacher.

In this case, an observer would collect data throughout the entire day, completing a series of three observations of three minutes each on FLACCS, followed by a comparable series for the TPOR, and alternating instruments until four series of each have been collected (a total of 8 series of 24 three-minute observation periods). Observation of reading and math instruction would be distinguished from observation during other classroom activities. After completing a series of 3 observations on either instrument, the observer would record the amount of time the typical pupil spent on reading, math, or other subject matter, time spent waiting for the next activity, free choice activities, planned relaxation and lunch and recess. (NOTE: This instrument hasn't been developed yet. Our previous data collection used estimates made at the end of the day.) On a subsequent day, a second observer would repeat the same observation process.

If the self-contained classroom is individualized, a common organizational pattern would be a period of approximately 45 minutes given to reading instruction in which the teacher is available to one child or another. In the standardized classroom, the teacher might spend the same period of time working with three subgroups of pupils for approximately a third of the time each. In either case, observational data would be collected for the full reading period, assuming that it is equally representative of the classroom environment experienced by the typical pupil--that being a member of a small group with the teacher for 15 minutes gives essentially the same access to the teacher as being a class member for 45 minutes (except for the differences made by individualization, which would be represented by the data recording degree of implementation of individualization).

A more complex instructional scheme would be one in which all pupils leave the regular teacher for instruction in math or reading. In this case the observer will observe in the regular classroom until pupils leave for the special instruction, but will accompany them to the math or reading teacher or center, and will collect observational data there using the same procedure described earlier. As with the self-contained classroom, a second observer would repeat the same observation procedure another day. For this pattern of organization, since another teacher is involved whose style is likely to differ from the regular teacher, it would be necessary, in order to obtain an adequately reliable measure, for each observer to observe that teacher teaching this subgroup of pupils another day. Hopefully, in most schools this center would serve several classrooms also in the study, so that the supplemental day's observation would provide data for several classrooms.

The next more complex pattern would be one in which all children leave the regular classroom for instruction in both math and reading. In this case, an observer would accompany pupils to both specialized instructional settings, and these data would be taken as portions of these pupils' day, supplemented by additional observations as was true of only one subject-matter outside the regular classroom.

Still another probable pattern would be one in which a three-teacher team teaches a pupil group equivalent to three classrooms. Each teacher is lead teacher one week, in rotation. In that case, observational data would need to be collected three different weeks, by both observers, in order to represent the total classroom environment experienced by the typical pupil.

Another complex pattern is one in which departmentalization is carried beyond instruction in reading and math and pupils move as a classroom group to social studies or other instruction. In this case, the general pattern of environmental observation in which the observer follows the pupil group would be extended.

In this case, to obtain measures of environment for each subject-matter as reliable as those for the self-contained classroom would require as many additional observations by each observer as there are instructional settings outside the regular classroom. (NOTE: At this point, it is important to recognize that each such classroom costs two to perhaps four classrooms in total N.)

These are some of the patterns which we anticipate meeting in the field and illustrate the general principle of collecting data intended to represent the total daily experience of the typical child. If other patterns are met which are not included above, the same general principle would be applied in attempting to collect observational data for each portion of the day which would be sufficiently reliable to permit discrimination of the classroom environment between individualized vs standardized and mainstream vs separate instruction, and to identify concomitant variation.

III. METHODOLOGY

B. STUDY QUESTION TWO

4. Data Analysis Plan

a. Data Management

The data management procedures have been specified under Study Question One (see Section III A.4.a.)

b. Data Reduction and Transformation

For Study Question Two the unit of analysis is the class. Therefore, all student data should be reduced to the class level by taking an average over students.

The contractor will need to attend to all the processes described under Section III.A.4.a and in addition it will be necessary to attend to the following:

- Retrieve the ITTOF observational data and the FLACCS, TPOR and GR observational data, the students' pretest scores on the CAT for both math and reading and posttest scores on HIFAM and HIFAR.

- Scoring of HIFAM and HIFAR should be done using a program such as SCOREWR2 (Rim, 1972) as the files are completed. The SCOREWR2 program is capable of handling weighted scoring problems (up to 10 different weighting keys), and provides various test statistics including coefficient alpha.

- Convert the CAT pretest scores to the ADSS scale scores.

- Eliminate students who do not have both pretest and posttest scores on the CAT.

- Compute residual gain scores on the CAT for those students having both pretest and posttest scores on the CAT.

- Reduce the individual student's residual gain scores to a class mean residual score. Individual student's scores on the MCI, HIFAR and HIFAM will also need to be reduced to class mean scores by taking an average across the compensatory education students in the class. For the two affective measures, HIFAM and HIFAR, an area transformation is recommended prior to taking an average. The observational data on the instructional treatment (ITTOF) will be reduced to a single scale value for each instructional task by averaging across observations. The observational data on classroom climate for reading and math would be aggregated separately from each other and from all others but, all observation data would also be totaled. Within each aggregate, item frequencies would be area transformed to normalize distribution and equalize variabilities. Items would then be factor analyzed and summed into incomplete factor scores. (Horn, 1965). A combination of MATRIX, TRANSFORMATIONS, and REGRESSION-CORRELATION programs in SOUPAC will handle these processes of data transformation.

c. Analytic Procedures

There are three analyses described in this section for the two subquestions of Study Question Two. They are: partitioning variance in multiple regression - Commonality Analysis (Mood, 1971), a series of stepdown regression analyses and canonical correlation.

Prior to the separate analyses it will be necessary to test whether there is a nonlinear relationship between independent and dependent variables. The analyses of variance test for nonlinearity (H. M. Blalock, 1960, p. 315) can be employed to determine if the linear model holds and, additionally, to test the significance of the additional amount of variance explained by a non-linear model. If there is a non-linear relationship between dependent and independent variables appropriate transformations should be made prior to analysis. A square root, logarithmic, or some other transformation might be used depending on the distribution of the data.

For the analysis of Study Question Two part a the the specificity of task treatment (ITTOF) is the independent variable and the class mean residual gain scores on the (1) CAT math and reading subtests, (2) HIFAM and HIFAR attitude measures, and (3) student perceived classroom climate measures (MCI) are the eleven (11) dependent variables.

This study question asks for the unique contribution of each instructional task treatment and the amount of variance accounted for by some sequential combinations of these variables. For the former the partitioning of variance in multiple regression analyses will be used. For the latter, stepdown regression analysis for each dependent variable is recommended for investigating the amount of variance accounted for by the sequential combinations of these variables.

Further, in order to see the relationship between all the dependent and independent variables, the eleven dependent variables would be employed as criteria in the canonical correlation analyses, while all of the instructional task treatment variables would serve as predictors.

Study Question Two part b is essentially the same as Study Question Two part a except that (1) the set of classroom climate factors would be added to the independent variable set and (2) the stepwise regression analysis would be used.

The stepdown regression analyses can be run on SPSS (Statistical Package for the Social Sciences) and the remainder of the analyses can be performed by using SOUPAC (Statistical Oriented Users Programming and Consulting).

Some expected tables are shown as follows:

Partitioning Variance for Three Sets (W, V, Z) of Variables

	W	V	Z
(1) Part unique to W	8%		
(2) Part unique to V		13%	
(3) Part unique to Z			20%
(4) Part common to W and V	3%	3%	
(5) Part common to W and Z	8%		8%
(6) Part common to V and Z		7%	7%
(7) Part common to W, V and Z	1%	1%	1%
TOTALS	20%	24%	36%

STEPDOWN MULTIPLE REGRESSION ANALYSIS

```
DEPENDENT VARIABLE..    Reading

VARIABLE(S) ENTERED ON STEP NUMBER 1..   Curriculum Scope (PG1)

Multiple R          0.93729        Analysis of Variance   DF    Sum of Squares     Mean Square       F
R Square            0.87852        Regression              1.     339937.40614    339937.40614   216.946
Standard Error     39.58437        Residual               30.      47004.68172      1566.92272

------------------VARIABLES IN THE EQUATION ---------------------------VARIABLES NOT IN THE EQUATION------

VARIABLE       B       BETA    STD  ERROR B       F           VARIABLE      BETA IN   PARTIAL   TOLERANCE  F

PG1         0.01357  0.93729       0.00092   216.946           PG2        -0.75329  -0.47045   0.04738   8.243
(Constant) -85.48109                                            PG3         0.50029   0.72182   0.25289   9.014
                                                                 .             .         .         .        .
                                                                 .             .         .         .        .
                                                                 .             .         .         .        .
                                                                PG18        0.45524   0.73122   0.24406  32.174
----------------------------------------------------------------------------------------------------------
DEPENDENT VARIABLE..   Reading

                                     SUMMARY TABLE

VARIABLE            MULTIPLE R   R SQUARE  RSQ CHANGE  SIMPLE R      B         BETA

PG1                   0.93729    0.87852    0.87852    0.93729    0.01574    1.08714
PG2                   0.95153    0.90540    0.02689    0.87912   -0.15462   -0.55669
 .                       .          .          .          .          .          .
 .                       .          .          .          .          .          .
 .                       .          .          .          .          .          .
PG10                  0.97774    0.95598    0.05058    0.93667    0.42506    0.45524
(Constant)                                                    -111.70268
```

CANONICAL CORRELATION ANALYSIS

EQUATION	EIGENVALUE	CANONICAL CORRELATION	WILKS LAMDA	CHI-SQUARE	DF
1	0.7787	0.8825	0.0346	55.4879	36.
2	0.7223	0.8499	0.1565	30.6004	25.
3	0.2946	0.5428	0.5637	9.4596	16.
4	0.1926	0.4389	0.7991	3.7013	9.

CRITERION WEIGHTS (CRITERIA DOWN, EQUATIONS ACROSS)

	1	2	3	4
VCBL	-0.14126	-0.03130	0.51950	1.20597
CMHS	0.72525	-0.52465	0.85733	0.05642
CMPT	0.28166	-0.28663	-0.67357	0.12355
CPPM	-0.34661	-0.22524	-0.24385	-0.24820

PREDICTOR WEIGHTS (PREDICTORS DOWN, EQUATIONS ACROSS)

	1	2	3	4
PG1	0.46729	-0.35708	-0.98670	-0.07439
PG2	0.65448	-0.06620	0.67195	-0.80029
PG3	-1.16949	-0.19880	0.28097	0.60829
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
PG18	0.51117	-0.25653	-0.15127	1.09339

C. STUDY QUESTION THREE

1. Rationale for Selection of Variables, Definitions and Instrumentation.

At the initial contractors conference the NIE indicated that it would not be inappropriate to design plans that would enable one to determine how program variables, and other variables of concern, relate to each other and to program effectiveness. In some ways this may be construed as an extension of Study Question Two. In that question, program and climate variables were related to sets of cognitive and affective outcomes. In the present case it would be of considerable interest to determine how program variables together with the climate and affective outcome variables employed in Study Question Two relate to one another and to academic achievement. Elsewhere, we have indicated that there is a need to go beyond the direct comparison issue dealt with in Study Question One as the instructional labels "individualized" and "standardized" encompass variations that may themselves produce decidedly different outcomes. Additionally, it is inconceivable that instructional types alone can account for all the variation in program effectiveness. We need to ascertain more exactly the nature of the conditions that do make useful particular factors of instructional treatment.

The following study question has been developed by us as a guide for responding to this issue:

> *How does specificity of the treatment of the instructional tasks, along with other variables of concern, relate to student achievement?*

The variable categories selected for this study question are:

1. Student Characteristics
2. Community and School Characteristics
3. Teacher Characteristics
4. Teacher Attitudes and Behavior
5. Task Treatment
6. Opportunity
7. Student Attitudes and Behavior
8. Mathematics and Reading Achievement

The above mentioned variables were selected for a number of different reasons. For example, the variable categories: Teacher Characteristics, Student Characteristics, Teacher Attitudes and Behavior (that is, teacher performance), and Student Attitudes and Behavior (or student performance) are frequent components of teacher effectiveness studies. (See Koehler, 1974, for example.) In an earlier paper Soar (1974) makes the case for including home, community, and school characteristics as moderating variables on the aforementioned components. As a result of Soar's arguments and recent findings by Berman and McLaughlin (1975) we included the category Community and School Characteristics.

The rationale for the task treatment category is too obvious for discussion, but not so with the category "opportunity." It should be clear that achievement gain must be significantly related to the degree to which the learner has the opportunity (i.e., time) to learn (Carroll, 1963 and Harnischfeger and Wiley, 1973, for example).

The variable categories listed above are operationally defined by the variable sets below.

Student Characteristics

- Percent of the "class" having had prior experiences with individualized instruction.
- Ratio of boys to girls in "class."
- Percent of minority students in "class."
- Percent of students in "class" belonging to a low socioeconomic status group.
- Percent of students in "class" designated as being educationally disadvantaged.
- Averaged "class" intelligence quotient.

Information for the Student Characteristics category comes from two sources: the Student Data Collection Form (SDCF) and the Lorge-Thorndike Intelligence Test (LTIT). Both of these instruments are used to collect data for Study Question One.

Community and School Characteristics

- Per pupil expenditure from all sources.
- Origin of new programs.
- Degree of school district support for math and reading programs for compensatory education students (separately).

- Estimated percentage of families assisting as parent volunteers in compensatory education programs.
- Estimated percentage of families attending a typical parent group meeting, e.g., PTA.
- Number of years individualized compensatory education math program used in school.
- Number of years individualized compensatory education reading program used in school.

Data from the School Principal's Questionnaire (SPQ), used primarily for responding to Study Question Four, provides data for this category. Items selected for the SPQ were based, in part, upon the Berman and McLaughlin (1975) studies.

Teacher Characteristics

- Sex of teacher.
- Race of teacher.
- Number of years teaching compensatory education students.
- Number of years working with the program.
- Perceived adequacy of special program training.
- Perceived degree of autonomy in setting curricula goals for class.
- Attitudes toward education (progressivism vs traditionalism).

Data for the teacher characteristics variable are derived from two sources: the Teacher Questionnaire (TQ) and Kerlinger's Educational Scale-VII (ES). Both of these measures are used in responding to Study Question Four. The Educational Scale-VII (ES) is a Likert-type scale that measures two broad dimensions of attitudes toward education: progressivism and traditionalism. The scale has been used in a number of studies and has been found factorially valid and reasonably reliable. One would assume that the most desirable teaching situation would be where there is a match between a teacher's values toward education and instructional assignment. Any dissonance in this matchup may, conceivably, lead to implementation instability.

Teacher Attitudes and Behavior

- Teacher morale, total score, as measured on the Purdue Teacher Opinionaire.
- Attitude toward program (math and/or reading).
- Negative control vs. orderly classroom.
- Expansive teaching.
- Free movement and positive affect with little focus.
- Teacher choice of problem.
- Seat work without teacher.
- Recitation.

Teacher morale data as well as teacher attitudes toward the program are employed primarily in response to Study Question Four. The remaining data, closely related to what is meant by classroom climate, are employed primarily for Study Question Two as well as for Study Question Four. The data related to teacher attitudes are collected from items found on the Teacher Questionnaire (TQ) which is also used to provide information in respect to the composite variable: teacher characteristics.

The *Purdue Teacher Opinionaire* (PTO) is designed to provide a measure of teacher morale. Not only does the *Opinionaire* yield a total score indicating the general level of a teacher's morale, but it also provides meaningful sub-scores which break down morale into some of its dimensions. The ten categories included are: (1) Teacher Rapport with Principal; (2) Satisfaction with Teaching; (3) Rapport Among Teachers; (4) Teacher Salary; (5) Teacher Load; (6) Curriculum Issues; (7) Teacher Status; (8) Community Support of Education; (9) School Facilities and Services; and (10) Community Pressures.

The *Opinionaire* provides specific and valid information about crucial problems and tensions which concern the faculty and have an adverse effect on their morale. For Study Question Three only the total score will be employed.

Teacher behavior data is collected by use of the *Florida Climate and Control System* (FLACCS) developed by Soar and Soar (1973), the *Global Ratings* (GR) scale, and Bob Burten Brown's *Teacher Practices Observation Record* (TPOR). All of these instruments have been discussed previously in the context of Study Question Two.

Task Treatment is a category composed of the ten program variables described earlier for Study Questions Cne and Two. Data collected on the *Instructional Task Treatment Observational Form* (ITTOF) will be accumulated over the number of visits to each classroom -- six visits has been the suggested amount -- in order to obtain values for each of the dimensions. In this instance, the degree of specificity for each dimension is loosely analogous to the sum of the vector sums of instructional unit size and level of attention dimensions divided by the total number of visits to the classroom. The variables concerned with specificity of task treatment are listed below.

- Provision of curriculum opportunity.
- Statements of curriculum intentions.
- Curriculum placement decisions.
- Adjusting rates of instruction.
- Provision for individual responding.
- Provision for individual feedback.
- Monitoring individual progress.
- Performance standard for advancement.
- Evaluation of performance.
- Matching learners with next instruction.

Opportunity, another variable category, is concerned primarily with teachers providing the opportunity for students to learn. Opportunity will be affected by time as well as by the teacher/pupil ratio, etc. Some of the items in this category are:

- Number of adults in the classroom.
- Enrollment size of the designated "class" of learners.
- Enrollment size of the "regular" class.
- Instructional grouping procedures.

- Average quantity of instruction in mathematics.
- Average quantity of instruction in reading.

The information for the above items is derivable from the Student Data Collection Form (SDCF) and from the Classroom Description (CD) form. Both of these instruments are employed during observational visits. Opportunity data is also used for Study Question Four.

Student Attitudes and Behavior data is derivable from the four instruments used to collect information for Study Question Two: My Class Inventory (MCI), How I Feel About Math (HIFAM), How I Feel About Reading (HIFAR), and Florida Climate Control System (FLACCS). Items in this category are:

- Satisfaction.
- Friction.
- Competitiveness.
- Difficulty.
- Cohesiveness.
- Attitudes toward mathematics.
- Attitudes toward reading.
- Negative control vs orderly classroom.
- Free movement and positive affect with little focus.

Outcome variables of interest in Study Question Three are as follows:

- Reading Achievement.
- Mathematics Achievement.

In both instances we are concerned with gain scores for reading and mathematics achievements. The California Achievement Test (CAT) should be used here.

2. Sampling and Selection.

a. Sampling Design

All of the primary sampling dimensions employed for Study Questions One and Two are to be used for Study Question Three.

As in Study Question Two the unit of analysis is the class.

3. Data Collection Plan.

Data collection plans for most of the data that will be analyzed for Study Question Three have already been discussed in the appropriate sections of Study Questions One and Two. Table III.4 provides a list of measures suggested for use in this phase of the study. Instruments not previously mentioned include the following:

Teacher Questionnaire
Educational Scale - VII
Purdue Teacher Opinionaire
School Principal's Questionnaire
Classroom Description

Learner measures, such as, How I Feel About Mathematics (HIFAM), How I Feel About Reading (HIFAR), and My Class Inventory (MCI) are administered as outcome measures (and used as such for Study Question Two), but are used as intervening variables for this study question.

Table III.4. Instrument and Data Classification Scheme

Study Question 3

SOURCE	ANTECEDENTS	TRANSACTIONALS	OUTCOMES
Learner	Lorge-Thorndike Intelligence Test (LTIT) (X1) *Student Data Collection Form (SDCF) (X1) Calif. Achievement Test (CAT) Reading and Math	How I Feel About Mathematics (HIFAM) (X7) How I Feel About Reading (HIFAR) (X7) My Class Inventory (MCI) (X7) *Student Data Collection Form (SDCF) (X6)	*California Achievement Test (CAT) Reading and Math
Teacher	*Teacher Questionnaire (TQ) (X3) Educational Scale-VII (ES) (X3)	*Teacher Questionnaire (TQ) (X4/X6) Purdue Teacher Opinionaire (PTO) (X4)	
Program	School Principal's Questionnaire (SPQ) (X2)	Instructional Task Treatment Observation Form (ITTOF) (X5) School Principal's Questionnaire (SPQ) (X5)	
Class		Florida Climate and Control System (FLACCS) (X4/X7) Global Ratings (GR) (X4) Teacher Practices Observation Record (TPOR) (X4) Classroom Description (CD) (X6)	

* Different sets of items from the same instrument are used for different composites.

The Educational Scale - VII (ES) should be administered to teachers as a pretest and the Purdue Teacher Opinionnaire (PTD) as a posttest. As the Teacher Questionnaire (TQ) requests information re attitudes toward the programs, it should be used as a posttest. Information needed earlier is obtainable from [illegible]eacher Questionnaire-Screening (TQ-S) instrument.

The School Principal's Questionnaire (SPQ) may be administered during the early part of the school year.

The Classroom Description (CD) instrument should be used each and every time an observation is made.

4. Data Analysis Plan.

a. Data Management

The data management procedures for this study question have been specified under Study Question One (see Section III A.4.a).

b. Data Reduction and Transformation

As indicated earlier, the class will be the unit of analysis for answering Study Question Three. Almost all of the data collected for this study will be used in this stage of analysis. Because of this, numerous and various data reduction and transformation techniques are expected to be employed.

The students' residual gain scores on the CAT Reading and CAT Mathematics subtests that were derived for Study Question Two will be used as dependent variables.

Students' IQ and SES, used in answering Study Question One, will have to be reduced to class means by averaging across students in the designated class. The class mean scores on such affective measures as HIFAR, HIFAM, and MCI that were derived for Study Question Two can be used directly in answering Study Question Three. However, it may be necessary for later analyses to combine the MCI factor scores into composite scores by applying the first principal component loadings as weights.

Student data collected on the SDCF (e.g., proportions of boys/girls, proportion of minority group members, the average number of years students were in the program, and the average amount of opportunity for instruction) will be retrieved and reduced to the class level. Antecedent teacher variable data, such as (1) number of years teaching compensatory education students, (2) number of years in the program, (3) quality of received training, (4) sex, (5) race, and (6) philosophical value score on the Educational Scale measure will be reduced by use of a dimensionality reduction procedure immediately after responses on the Educational Scale measure are scored.

Teacher's attitude toward the program from questions on the Teacher Questionnaire and the Purdue Teacher Opinionnaire data will be scored by using a computer program that can handle weighted scoring problems.

The contractor can use the scale scores on ITTOF and factor scores on the TPOR, GR, and FLACCS that were already transformed and reduced to the class level for Study Question Two. Since the contribution of this variable to student outcomes was investigated in Study Question Two, we recommend that a composite score be derived by applying the first principal component loadings as weights. We recommend that a single composite score be derived for the ITTOF and two composite scores (e.g., one for teacher affect and one for student affect) be derived for the TPOR, GR, and FLACCS. Data collected on the Classroom Description instrument and the School Principal Questionnaire can be directly entered into the analysis.

Through the procedures described above, the contractor will have a score that is reduced to the class level for each of the variables listed in the study variable section (III-C-1).

c. Analytic Procedures

In examining the relationship of specificity of instructional task treatments along with other variables of concern in respect to student outcomes, we recommend a variety of regression analyses and path analyses techniques.

The residual gain scores for each of the subtests of the CAT Reading and CAT Mathematics tests will be analyzed, separately, as dependent variables. It is especially important for the contractor to analyze the subtest gain scores, as each subtest is designed to measure different levels of the students' cognitive abilities. Previous findings by Soar and Soar (1973) lead us to believe that the relationship of each variable of concern to one another and to the students' higher level cognitive outcomes might be different from those relationships formed in respect to the lower cognitive outcomes.

To examine the unique contribution of each independent variable as well as the contributions of some combinations of variables of interest, we recommend the method of partitioning variance in multiple regression analyses (Mood, 1971). Stepwise regression analysis is recommended for determining what special set of variables can account for most of the variance.

In addition to the aforementioned concerns, the RFP requests plans

> "...to include specifications for arguing causal relationships between program and outcome variables."

Such a request may be construed narrowly -- as when "program" is taken to refer only to different types of instruction; i.e., "individualized" and "standardized" -- or, more broadly, as when the requested specifications may also include sets of variables (other than program variables) that have in the past been linked, directly or indirectly, to program outcomes.

We have, in Study Question One, been responsive to this request of the NIE; that is, when the request is viewed in the more limited sense. Because it is meaningful to do so, we intend, in this design section, to respond to NIE's request taken in its broader context.

We recommend the use of path analytic techniques in examining or speculating about the causal relationship that may exist between student outcomes and other variables of interest. Path analysis is often used as a basis for inferring causality. As Tatsuoka (1973) has indicated, a prior figurative modeling along path analytic lines is very helpful in sharpening the speculations and the consequent avenues for testing the resulting hypotheses.

The number of variables we recommend for inclusion in the path diagram (see the hypothetical model, for example) has been guided by the size of the sample studied and by our estimate of the level of complexity that we believe can be reasonably managed. This view led us to the conclusion that only a small number of variables should be considered. Such a decision requires then that, when appropriate, composite scores be employed.

We recommend the reduction of the number or dimensionality of the following major sets of variables by deriving a composite score for each subset of variables using the first principal component loadings as weights in order to maximize the internal consistency of the composite measure (Lord, 1958):

Teacher Characteristics (TC)

1. Training and experience
   - Teacher's perception of adequacy of special program training
   - Number of years working with the program
   - Number of years teaching compensatory education students
2. Affective entry variable
   - Teachers philosophical position (progressivism vs. traditionalism)
   - Teacher's perception re autonomy in setting goals for class
3. Sex of teacher
4. Race of teacher

Community and School Characteristics

1. Principal's perception re program support
   - Principal's perception re the program
   - Principal's perception re school district's support - Reading
   - Principal's perception re school district's support - Math
2. Community Support
   - Parent volunteer
   - Parent participation

3. Per pupil expenditure from all sources
4. Number of years math program used in school
5. Number of years reading program used in school

Student Characteristics

1. Percent of "class" having had prior experiences with individualized instruction
2. Ratio of boys to girls in "class"
3. Percent of minority students in "class"
4. Percent of students in "class" belonging to a low socioeconomic status group
5. Percent of students in "class" designated as being educationally disadvantaged
6. Averaged "class" intelligence quotient

Teacher Attitudes and Behavior

1. Teacher behavior
2. Teacher morale
3. Worth of math program
4. Worth of reading program

Task Treatment

1. Instructional task specificity

Opportunity

1. Student/adult ratio
    - Number of adults in the classroom
    - Enrollment size of the designated "class"
    - Enrollment size of the regular "class"
2. Instructional grouping procedures

3. Averaged quantity of instruction in mathematics
4. Averaged quantity of instruction in reading

Student Attitudes and Behavior

1. Student behavior
2. Student perceived classroom climate
   - Satisfaction
   - Friction
   - Competitiveness
   - Difficulty
   - Cohesiveness
3. Student attitudes toward mathematics
4. Student attitudes toward reading

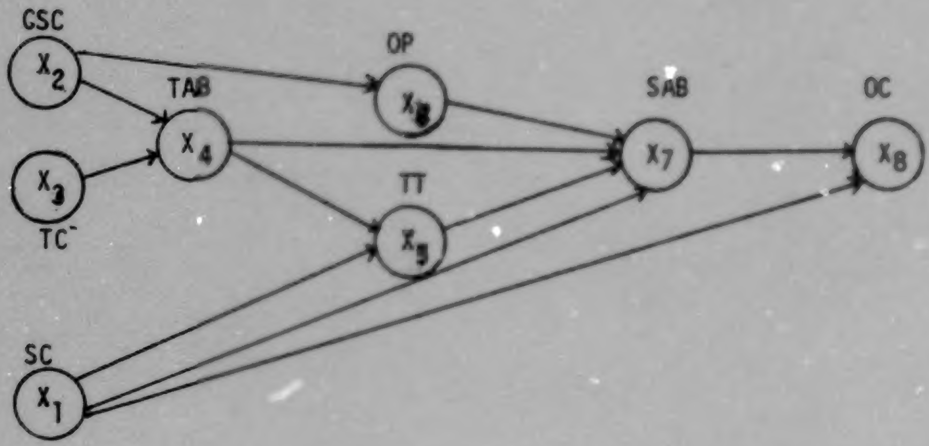
The total number of variables that result from the above described a priori process is twenty-eight (28). This total is determined from the number of subsets (variables) within a variable category: 4, 5, 6, 4, 1, 4, and 4, respectively.

From these a priori sets of variables, the contractor, depending upon the relationships determined in the commonality analysis and the results of the stepwise analysis contribution, may select single variables or a priori composite variables or even derive a new composite variable.

The path diagram provide here as a hypothetical model does assume that we employ but one variable for each node in the network.

Since we believe that Congress' interest would primarily be in the relationship between SES and outcomes, we strongly recommend that the SES variable be included in the path model.

HYPOTHETICAL MODEL



X_1 (SC): Student Characteristics.
X_2 (CSC): Community and School Characteristics.
X_3 (TC): Teacher Characteristics.
X_4 (TAB): Teacher Attitudes and Behavior.
X_5 (TT): Task Treatment.
X_6 (OP): Opportunity.
X_7 (SAB): Student Attitude and Behavior.
X_8 (OC): Outcome.

The student characteristics (X_1), community and school support (X_2) and teacher characteristics (X_3) will be treated as exogenous variables; i.e., the sources of variation are not dependent on other variables in the system. The remaining five variables (X_4 thru X_8) will be considered either as endogenous or dependent variables, in the path analysis.

The models can be modified if a discrepancy between these suggested sets and the results from using the stepwise regression and partitioning variance techniques should occur. The path analysis technique should be employed on the residual gain scores for each subtest of the reading and mathematics test. Proposed causal relations in the model should be tested in order to provide stronger arguments for causal relationships posited for this study (D. Amick and H. Walberg, 1975).

The tables of multiple regression and stepwise regression analyses are similar to the tables of stepdown regression analyses shown for Study Question Two. The product for the path analyses will be similar to the diagram displayed above with the exception that coefficients will also be included.

A final word is necessary. It is customary to issue admonitions about inferring causality from either field experiments where full control is not possible or from correlational analysis intended to show both relationships. Path analysis -- the technique we suggest for use in answering Study Question Three -- is a useful procedure for inferring causality under appropriate conditions. However, it is not expected that the contractor will be in a position to assign randomly students, etc. to treatments. Under such conditions, we feel that the path analysis results should be viewed with caution. In brief, while such data should be treated as heuristically valuable-- as indicating relationships worthy of further exploration-- they should, more importantly, indicate relationships requiring confirmation under better controlled conditions before inferring causality.

III. METHODOLOGY

D. STUDY QUESTION FOUR

1. Rationale for Selecting Variables, Definitions and Instrumentation

Under Study Question One we have designed procedures for identifying well-implemented individualized instruction and well-implemented standardized instruction and additional procedures for determining the relationship between the degree of program implementation and student outcome variables. The RFP also requires that the study design provide for the description of "circumstances under which implementation of either individualized or standardized programs is difficult to achieve" if consistent implementation problems have been found. This is the intent that underlies our Study Question Four:

> *What are the conditions that contribute to differences in degree of implementation?*

With the exception of two variables; i.e., instructional type (individualized vs standardized) and instructional setting (mainstream vs separate grouping) described in Study Question One, the rationale for and description of the 57 variables used in this design section are to be found in Section 1 of Study Question Three.

2. Sampling and Selection

The sampling design, selection procedures, and suggested size for answering Study Question Four are the same as those for Study Question One.

3. Data Collection Plan

As the Table of Instrument and Data Classification Scheme shows, no additional data collection is required in answering this question. Data collected for answering Study Question One part c and Study Question Three will be used here.

4. Data Analysis Plan

a. Data Management

The data management procedures are the same as specified under Study Question One (See III-A-4-a).

b. Data Reduction and Transformation

Study Question Four investigates the conditions under which adequate program implementation may be difficult to achieve. As degree of program implementation is to be treated here as the dependent variable and is to be derived separately for each class, the class itself is the appropriate unit of analysis for this study question. The degree of program implementation data as reduced to the class level for Study Question One may be employed here also.

All data, excluding the instructional task treatment variables that were reduced to the class level at the first stage of data reduction for Study Question Three, will be used in

Table III.5 Instrument and Data Classification Scheme

Study Question 4

SOURCE	ANTECEDENTS	TRANSACTIONALS	OUTCOMES
Learner	Lorge-Thorndike Intelligence Test (LTIT) *Student Data Collection Form (SDCF)	How I Feel About Mathematics (HIFAM) How I Feel About Reading (HIFAR) My Class Inventory (MCI) *Student Data Collection Form (SDCF)	Degree of Implementation (*Instructional Task Treatment Observational Form (ITTOF))
Teacher	*Teacher Questionnaire (TQ) Educational Scale-VII (ES)	*Teacher Questionnaire (TQ) Purdue Teacher Opinionaire (PTO)	
Program	School Principal's Questionnaire (SPQ)	Instructional Task Treatment Observation Form (ITTOF) School Principal's Questionnaire (SPQ)	
Class		Florida Climate and Control System (FLACCS) Global Ratings (GR) Teacher Practices Observation Record (TPOR) Classroom Description (CD)	

*Different sets of items from the same instrument are used for obtaining different variables.

answering this study question. Additionally, information identifying the sampling cell to which the class belongs; i.e., information regarding instructional type (individualized vs. standardized) and instructional setting (mainstream vs. separate grouping) will also be employed. (See III-A-1-a.) It should be noted that the ten factor scores from the teacher morale measure (Purdue Teacher Opinionnaire) will be used here instead of the total score. Thus, the total number of independent variables for this study question will be 57.

Degree of implementation information is available only for those classes included in the analyses for answering Study Question One part c. It is appropriate, therefore, to retrieve data from classes sampled for Study Question One.

c. Analytic Procedures

RBS recommends, as the analytical procedures for answering Study Question Four, the use of multiple discriminant analyses on predetermined class groups.

Sampled classes, depending upon their degree of program implementation, should be assigned to two or three groups such as well-implemented and not well-implemented class groups; or well-implemented, average implementation, and poorly implemented groups. The actual number of categories should be based upon those relations between the degree of implementation and student outcomes which were already examined in answering Study Question One part c. If the relation between degree of implementation and student outcomes was curvelinear, and if the curve showed a U-shape or a reversed U-shape, we would recommend the division of the sampled classes into three groups. Otherwise, two groups determined by the same cutting point used in Study Question One part a and part b is recommended for the discriminant analysis procedure.

Based on the grouping stated above, discriminant analyses would be performed on the independent variables described in the previous data reduction section. A study of standardized discriminant coefficients on a statistically significant discriminant function (two implementation class group cases) or on two discriminant functions (three implementation class group cases) will show on which variables those implementation groups are different from each other.

IV. LOGISTICAL PLANS

A. PROJECT ORGANIZATIONAL STRUCTURE

Three major task areas of the District II Survey have been identified as the basis of the proposed organizational structure. These as shown in Figure IV.1 include (1) Training, (2) Field Work, and (3) Data Processing and Analysis and as such comprise the three major work units of the proposed project organization. In addition to the major work units, the proposed organization includes a Recruitment and Staffing Group, a Research and Implementation Group, and a Monitoring and Quality Control Group.

The responsibility for the overall project management is the Project Director's as shown in Figure IV.1. This person would be responsible for all major decisions, allocation of staff resources, assignment of accountabilities, financial control, and setting of personnel policy. The Project Director would also be the principal investigator for the study taking a major role in the analysis and preparation of the final report.

The organization and staffing required for the study is directly related to the study time schedule shown in Figure IV.2. It has been assumed that the NIE time line will permit the study to begin on February 1, 1976 allowing a full seven months for the initial preparation phase prior to the 1976-77 school year. The actual in-school study phase of the study will run from September 1976 through April 1977. The Analysis

Figure IV.1. District Survey II Project Organization

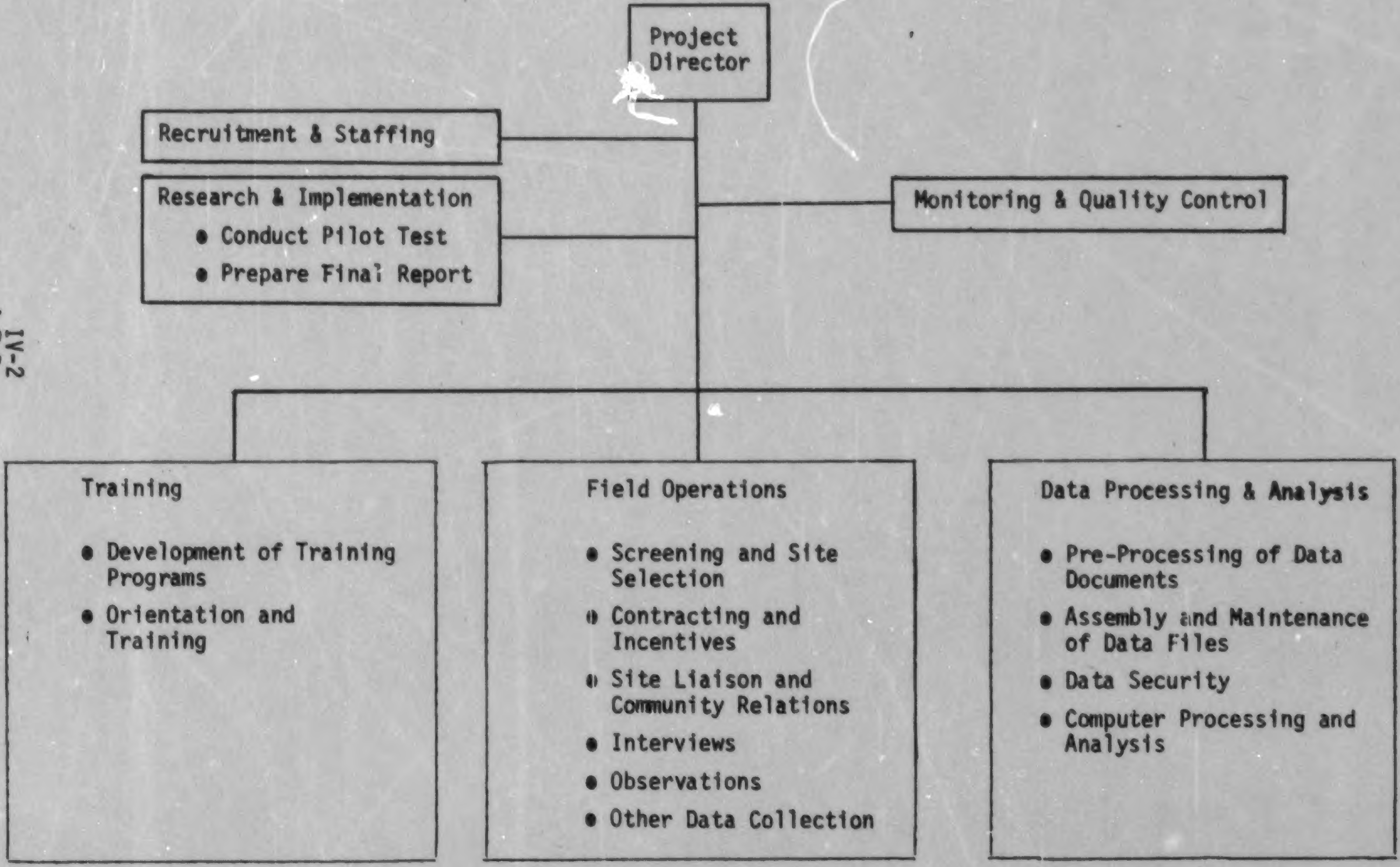

Project Director
Recruitment & Staffing
Research & Implementation
• Conduct Pilot Test
• Prepare Final Report
Monitoring & Quality Control
Training
• Development of Training Programs
• Orientation and Training
Field Operations
• Screening and Site Selection
• Contracting and Incentives
• Site Liaison and Community Relations
• Interviews
• Observations
• Other Data Collection
Data Processing & Analysis
• Pre-Processing of Data Documents
• Assembly and Maintenance of Data Files
• Data Security
• Computer Processing and Analysis

Figure IV.2. Schedule of Study Tasks

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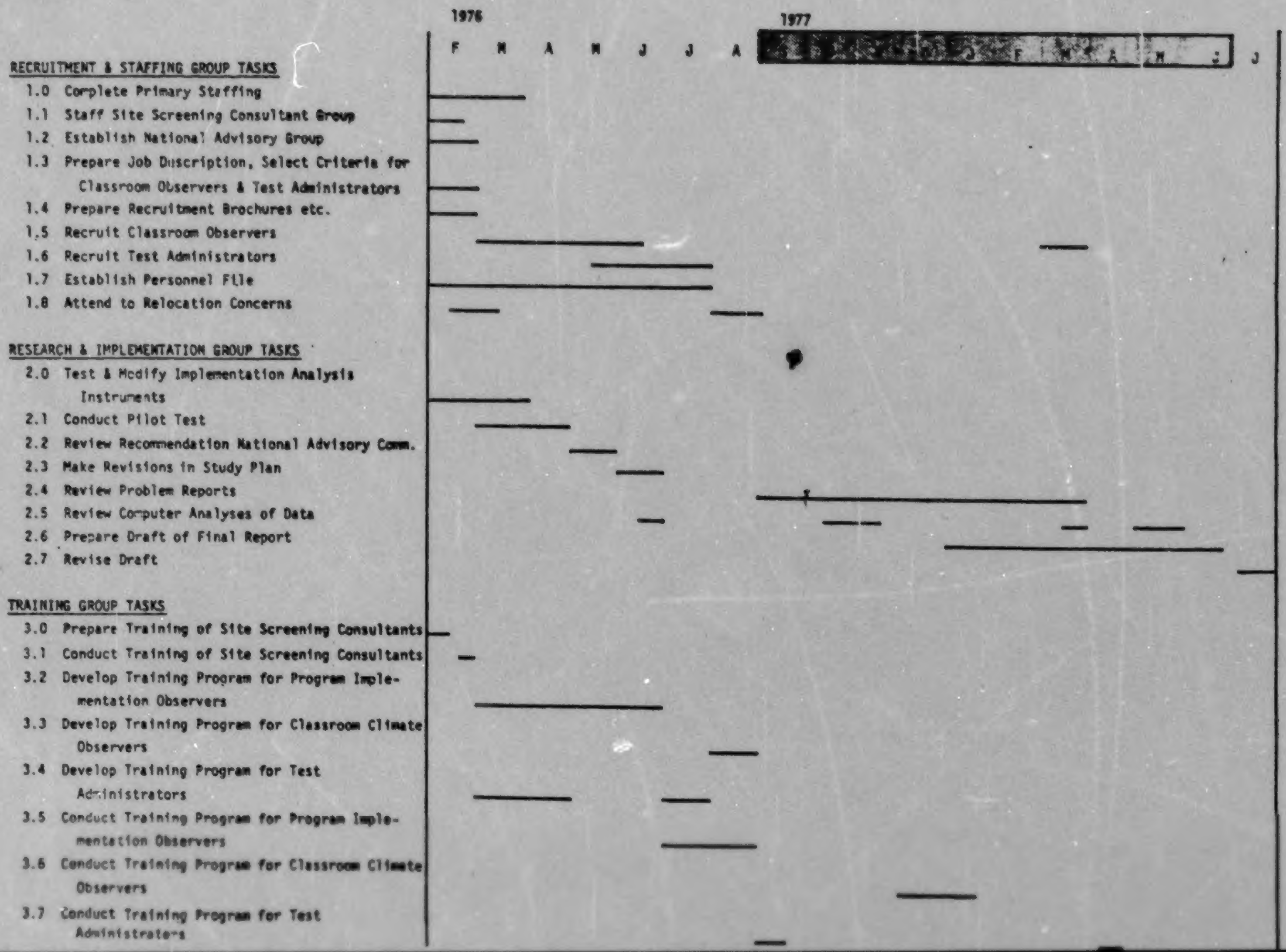

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FIELD OPERATIONS GROUP TASKS

4.0 Screening and Contracting

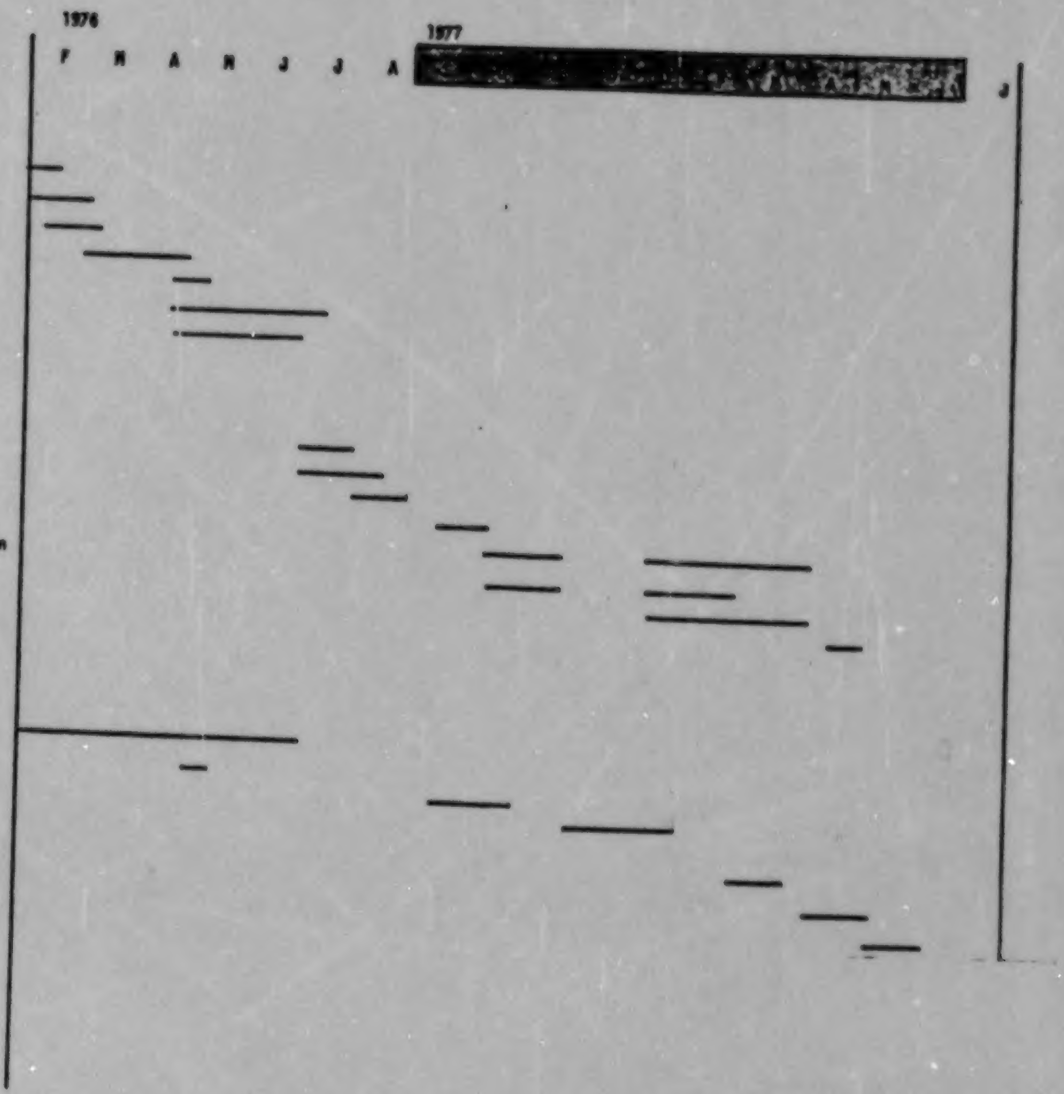
- 4.0.1 Assemble Pool of Nominated Sites
- 4.0.2 Prepare Descriptive Brochures
- 4.0.3 Conduct Telephone Screening
- 4.0.4 Conduct Site Screening
- 4.0.5 Make Site & Classroom Selections
- 4.0.6 Secure Joint Agreements
- 4.0.7 Conduct Community Support Activities

4.1 Observation and Data Collection

- 4.1.1 Prepare Detailed Field Work Schedule
- 4.1.2 Assign Field Operation Teams
- 4.1.3 Make Travel & Living Arrangements
- 4.1.4 Conduct Pre-Testing & Follow-Up
- 4.1.5 Conduct Program Implementation Observation
- 4.1.6 Conduct Interviews & Collect Other Data
- 4.1.7 Conduct Classroom Climate Observation
- 4.1.8 Conduct Post-Testing & Follow-Up

DATA PROCESSING & COMPUTER ANALYSIS GROUP TASKS

- 5.0 Implementation & Testing of PLAN
- 5.1 Provide IMS for Screening & Selection
- 5.2 Process & Analyze Pilot Test Data
- 5.3 Creation of Files & Process Pre-Test Data
- 5.4 Simulated Test with Random Data
- 5.5 Preparation of Pre-Printed Post-Test Answer Sheets
- 5.6 Processing & Analysis of Post-Test Data
- 5.7 Archiving of Data



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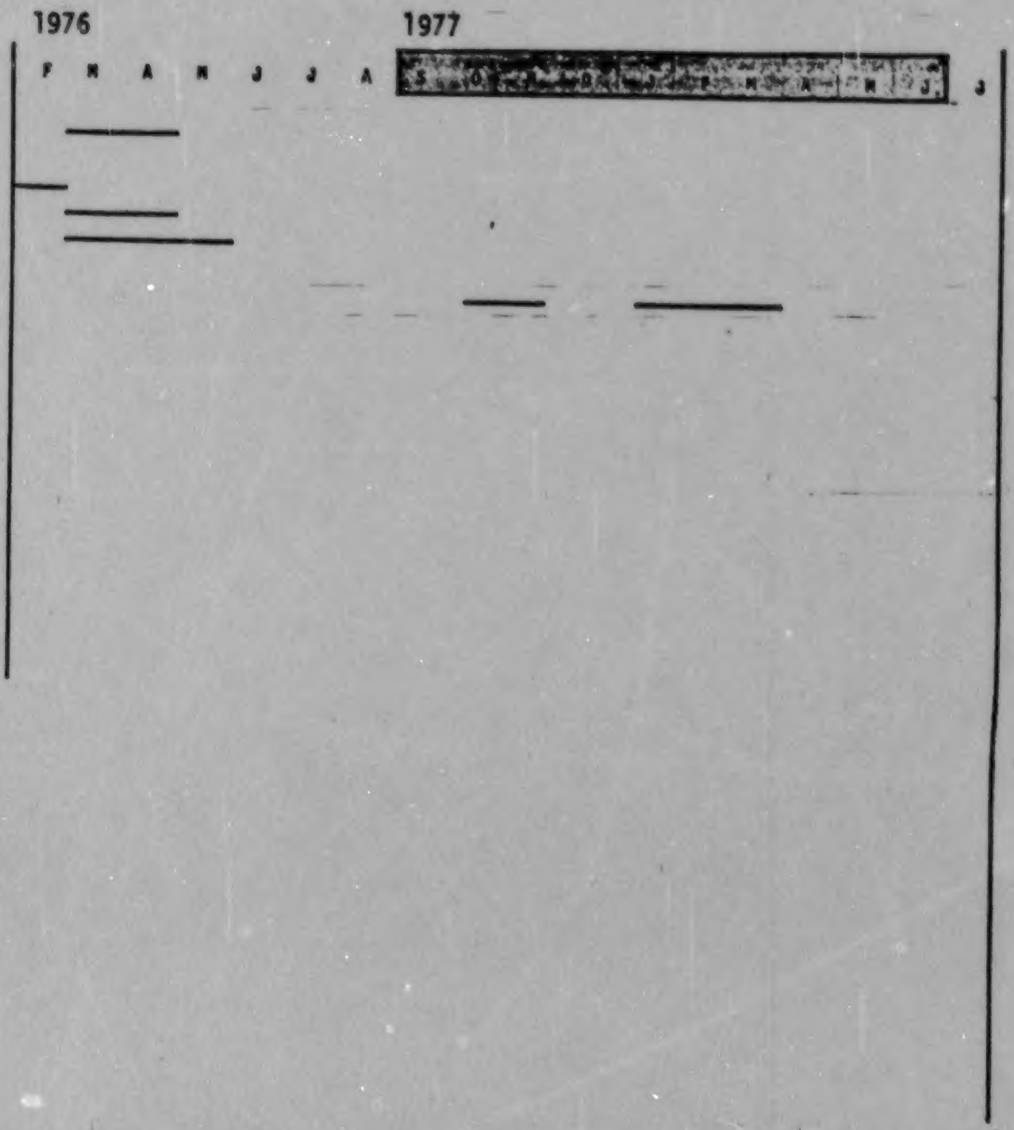
MONITORING & QUALITY CONTROL GROUP TASKS

- 6.0 Review by National Advisory Group
- 6.1 Develop Quality Control Assessment Procedure
- 6.2 Conduct Reviews of Screening
- 6.3 Conduct Reviews of Pilot Test
- 6.4 Conduct Reviews of Testing
- 6.5 Monitoring of Observation Processes
- 6.6 Quality Checks of Data Processing



and Reporting Phase will overlap the "in-school" study phase starting with the processing of pretest data during October 1976.

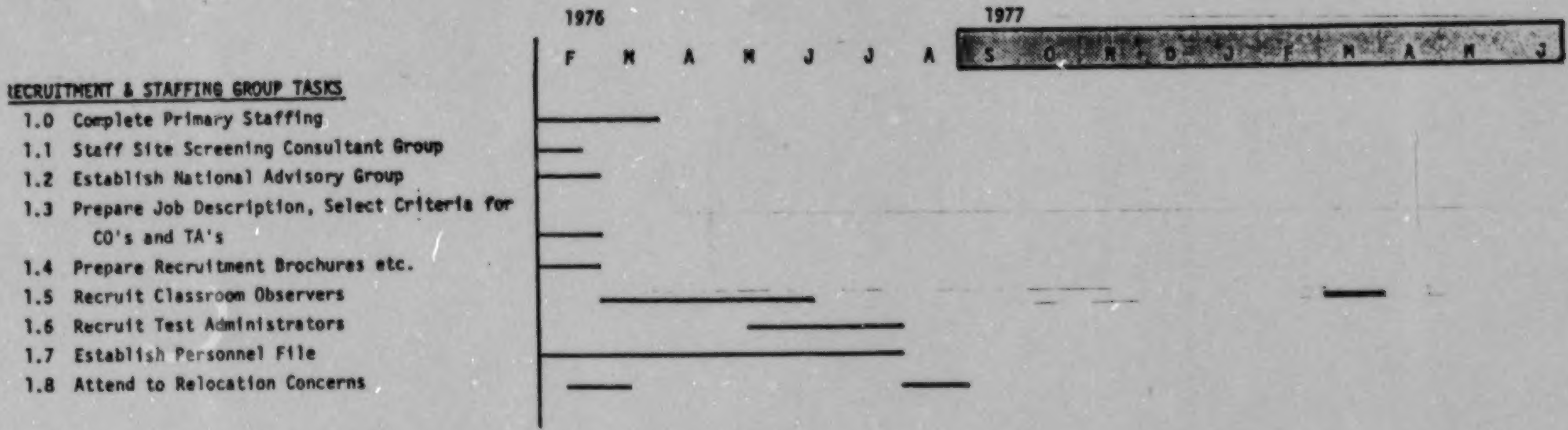
The duties of the primary or core staff will require specialized professionals with considerable training and experience. It will be necessary for these individuals to complete their initial assignment during the Preparation Phase in order to move into other major monitoring and writing assignments during the Field Work and Analysis phases. The preparation phase will include a recruitment and training effort for both full- and part-time staff in order to provide classroom observation teams, test administrators, and data collectors. The following sections will provide some detail regarding the proposed organizational work units, staffing requirements, nature and schedule of assigned tasks, as well as level of expertise and experience required.

1. Recruitment and Staffing Group

The major work of this group is scheduled between the beginning of the study and will last through July of 1976 at which time staffing for primary staff, classroom observers, test administrators, consultants and the National Advisory Review Committee will be completed. (See Figure IV.3.) In addition there may be a need to recruit additional test administrators in February of 1977 to replace staff who drop out of the study after the fall testing. (It has been anticipated that approximately 25% of the test administrators who participate in the fall testing will drop from the study because of changes in employment or availability.)

A primary concern of the entire recruitment effort will be to obtain as many qualified minority staff members as possible. To accomplish this goal, recruiting activities will be focused through minority employment services, university placement services where a significant number of minority groups may be enrolled, as well as various minority publications. Such publications might include The Black Scholar, The Journal of Negro Education, Integrated Education, and the Newsletter of the Black Child Development Institute. Contacts might also be made through minority caucuses of various national education groups and local offices of the Urban League in areas where study centers are being considered. This policy is warranted in as much as the study will be concentrating on populations where there is a high incidence of

Figure IV.3. Schedule of Tasks for the Recruitment & Staffing Group



minority groups.

A major criterion for employment in this study will be successful experience in working with educational programs for children from poverty backgrounds. This criterion will be used in screening applicants along with other educational and experience criteria shown in Figure IV.4.

The Recruitment and Staffing Group will also handle matters of a personnel nature for the project including office space arrangements for project personnel, relocation of new staff, and notification of unsuccessful applicants.

This first task of the Recruitment and Staffing Group will be to complete the primary staff. This will include identifying and hiring, where necessary, four Assistant Project Directors, the Research and Implementation Staff, the Training Staff, as well as support personnel. It is assumed that most recruitment for these jobs will have to be initiated by the contractor prior to February 1976 and will need only a short time to complete. The first task of major proportion is to locate and contract about 30 consultants to conduct the screening of potential study sites. Since this will be done during March and April requiring orientation and training during the last week of February, the time line on this task will require a rather intensive effort. However, since it is anticipated that much of the site screening can be done very effectively by college and university professors and their graduate students, the contractor should

Figure IV.4. Screening criteria for study staff

Primary or Core Staff

(1) Successful experience in working with educational programs for children from poverty backgrounds

(2) Successful experience with individualized educational programs

(3) Doctoral level education or equivalent experience

(4) Experience with observational and survey research tools

(5) Experience with formal educational evaluations

Classroom Observation Staff

(1) Successful experience in working with educational programs for children from poverty backgrounds

(2) Enrollment in a graduate degree program: Masters or beginning Doctoral level

(3) Successful classroom teaching experience or use of observational or survey research tools

Test Administrators

(1) Successful experience with educational programs for children from poverty backgrounds

(2) At least one year of successful teaching or substitute teaching experience

(3) Enrollment in a graduate program or employed as a substitute teacher in a participating district

anticipate focusing recruiting contacts on universities and colleges of education in metropolitan areas near anticipated study centers.

The second major task will be to staff the field operations group with 17 classroom observers and four field supervisors. This task's major difficulty will be attracting high quality people to a job lasting less than one year. Because these positions will involve considerable travel and will be of comparatively short duration, it is recommended that an attractive salary and benefits package be considered. It is also recommended that recruiting be centered in areas where study sites are apt to be located thus avoiding relocation costs as well as extensive costs for lodging and travel to and from home during the study. A final incentive to be offered to graduate student applicants would be an arrangement to give graduate credit for the training and field work experience.

The final major staffing task is the employment of test administrators. Since this position is part time, calling for as many as 11 days in the fall and 10 1/2 days in the spring, the recommended primary target for recruitment will be substitute teacher staffs from school districts participating in the study. A secondary target would be advanced students enrolled in graduate schools of education.

A minor but very important task early in the study will be to establish a National Advisory Committee for the purpose of reviewing the study plans, instruments, and reports. The group will provide essential external review at several stages. Recruitment will be based on nominations made by the NIE, USOE Title I office, Right to Read Program office, and other similar offices. Committee members will be selected on the basis of their expertise in either compensatory education, individualization, or educational research methodology with two being chosen from each area. Final screening will be done by the principal study staff based primarily on interest, availability and willingness to serve.

It is anticipated that 20 full- or part-time staff personnel, 17 classroom observers, and 97 test administrators will have to be recruited. Because of the continuing poor job market situation in education it is expected that approximately 10 to 15 applications will be received for each position. It is anticipated that recruitment and staffing processes will require one professional working full time for six months as well as ten other professionals working 10% time in screening and interviewing procedures over the five month period or a total of 3 person-months. The full-time professional will report directly to the Project Director. A full time secretary will also be needed for this effort for the six months. Following the completion of the staffing, both full time staff personnel will be reassigned to duties in the data processing and analysis group.

Figure IV.5 contains a complete listing of the various subtasks for the entire staffing and recruitment effort.

Figure IV.5. Staffing and Recruitment Tasks

1.0 Complete Primary Staff

1.1 Staff Site Screening Consultant Group

1.2 Establish National Advisory Group

1.3 Prepare Job Descriptions and Selection Criteria for Classroom Observers, Test Administrators, etc.

1.4 Preparation of Recruitment Brochures, Announcements and Advertisements

1.5 Recruitment of Classroom Observation Personnel

    1.5.1 Send Recruiting Materials and Announcements to Placement Agencies

    1.5.2 Develop File of Applicants

    1.5.3 Conduct Screening, Interviews, and Selection Process

    1.5.4 Complete Hiring Procedures for Selected Staff

1.6 Recruitment of Test Administration Personnel

    1.6.1 Solicit Nominations from Substitute Teacher Lists of Participating School Districts

    1.6.2 Contact Nominated Applicants by Letter Containing Application Forms

    1.6.3 Send Job Description to Graduate Schools Located in Area of Selected Sites if Substitute Teacher Approach Does Not Yield Enough Qualified Applicants

    1.6.4 Conduct Local Interviews for Interested Applicants

    1.6.5 Complete Review Process and Make Selections

    1.6.6 Secure Personnel Contracts for Selected Test Administrat[illegible]

1.7 Establish Personnel File of All Project Staff

1.8 Attend to Relocation Concerns for New Staff

2. Research and Implementation Group

This group will operate during the entire study with major responsibilities occurring during the Spring of 1976 and the Spring of 1977. A primary concern of this group will be to assist the Project Director in the proper implementation of the study design. This group of highly capable educational researchers will assist the Director in providing leadership. The primary responsibilities of this group will be the pilot test, the final analysis of data and the preparation of the final report. This will include the field testing and modification of the classroom observation instrument for measuring program variables, the ITTOF. The group will test out the proposed study design and implementation procedures during the pilot test in the spring of 1976. The group will recommend and make any necessary modifications in the procedures, conduct a major share of the final analysis and prepare major sections of the final report. The group will work closely with the other work unit leaders and the Monitoring and Quality Control staff. The scheduled major tasks of this group are shown on the time line in Figure IV.6. A listing of subtasks is contained in Figure IV.7.

It is anticipated that the primary staff required for this group will be as shown on the next page.

- 1 expert in individualized instruction
  75% time for 18 months
- 1 expert in research methodology
  75% time for 18 months
- 1 expert in compensatory education
  75% time for 18 months

In addition to these primary staffs it will be necessary to have staff from the Training Group work half time with the field testing of the ITTOF and the pilot test during the months of February, March, and April. This work, however, will dovetail into their training assignments and the split assignment should not be a problem.

While the primary members of the Research and Implementation Group will work only 75% time, they will work full time during the pilot test in the spring of 1976 and again during the analysis period in the spring of 1977. They will have reduced Research and Implementation duties during the fall of 1976 and winter of 1977 moving into other supervisory and monitoring positions. During the pilot test they will work closely with the Project Director and will have the assistance of principal members of the Field Operations Group and the Data Processing and Analysis Groups. Each member of the Research and Implementation Group will report directly to the Project Director.

Figure IV.6. Schedule of Major Tasks of Research and Implementation Group

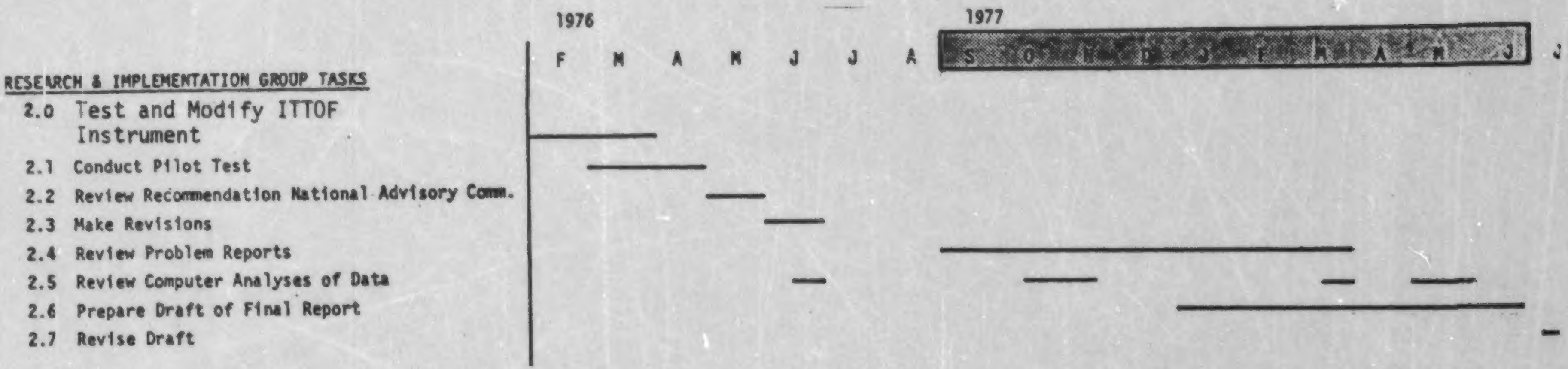


Figure IV.7. Research and Implementation Group Subtasks

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- 2.0 Testing and Modification of ITTOF
  - 2.0.1 Arrange for Test Classrooms
  - 2.0.2 Train Staff to Use ITTOF
  - 2.0.3 Conduct Observations
  - 2.0.4 Evaluate Observation Reliability and Useability
  - 2.0.5 Revise Instrument
  - 2.0.6 Recycle if Necessary
- 2.1 Conduct Pilot Test
  - 2.1.1 Select Sites for Pilot Test
  - 2.1.2 Obtain Necessary Joint Agreements and Community Support for Pilot Test
  - 2.1.3 Conduct Tryout of ITTOF Observation Procedure
  - 2.1.4 Conduct Tryout of Classroom Climate Observation Procedures
  - 2.1.5 Conduct Tryout of All Interview Schedules to be Used in Study
  - 2.1.6 Conduct Tryout of Other Data Collection Procedures
  - 2.1.7 Conduct Tryout of All Posttesting Procedures to Classroom Groups Observed in Pilot Test
  - 2.1.8 Conduct Tryout of All Data Processing and Computer Analysis Procedures
  - 2.1.9 Review All Study Procedures Based Upon Results of Tryouts and Make Recommendations for Revision

Figure IV.7

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2.2 Review Recommendations for Revision of Study Procedures with National Advisory Committee and the NIE

2.3 Make Necessary Revisions to Study Procedures Resulting From Pilot Test Following Approval of National Advisory Committee and the NIE

2.4 Review Problem Reports and Recommendations for Procedural Changes from Quality Control and Monitoring Group

2.5 Along with Project Director Review Computer Analysis of Study Data and Recommend Further Analyses Whenever Warranted

2.6 Along with Project Director Prepare First Draft of Final Report

2.7 Revise Draft of Final Report Based Upon Review by National Advisory Committee and the NIE

3. Training Group

The training group will operate during the eleven months starting from February of 1976 with the major activities being completed during the first eight months. (See schedule of major training tasks in Figure IV.8.)

The primary concerns of the Training Group will be developing and conducting four training programs. The training programs will be developed for (1) the screening site consultants, (2) the program implementation observation teams, (3) the classroom climate observation teams, and (4) the test administrators. The development of each of the training programs will follow a traditional development sequence shown in the listing of Training Subtasks in Figure IV.9.

The training for program implementation observations will occur during July and August of 1976 culminating with trial observations during late September and early October. The training will include approximately 15 hours of simulated classroom observation time and 10 hours of actual classroom observation time. The observers will also receive training in test administration and will, in turn, be expected to train the local test administrators. It is estimated that the entire training program for classroom observers will involve 50 to 60 hours of classroom instruction in addition to fairly intensive observational work in

Figure IV.8. Schedule of Training Group Tasks

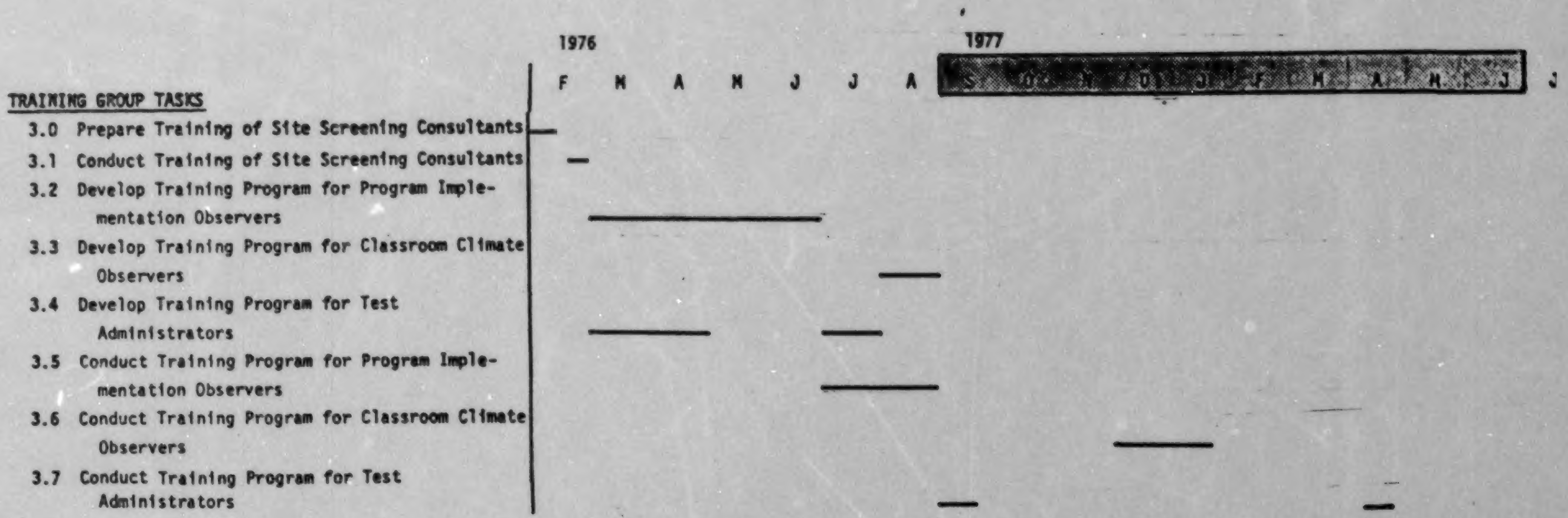

Figure IV.9. Training Group Tasks

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- 3.0 Prepare Training/Orientation of Site Screening Consultants
- 3.1 Conduct Training/Orientation of Site Screening Consultants
  - 3.1.1 Arrange for Needed Training Facilities
  - 3.1.2 Conduct Training
  - 3.1.3 Evaluate Effectiveness of Training
  - 3.1.4 Review Evaluation Results and Recommend Termination of Trainees Not Meeting Acceptable Criteria
- 3.2 Develop Training Program for Program Implementation Observations
  - 3.2.1 Conduct Needs Analysis
  - 3.2.2 Prepare Objectives
  - 3.2.3 Prepare Criterion Measures
  - 3.2.4 Develop Lesson Plans and Learning Activities
  - 3.2.5 Develop Learning Materials
  - 3.2.6 Obtain Logical Critical Review of Training Program Components and Revise Accordingly
- 3.3 Develop Training Program for Classroom Climate Observations
  - 3.3.1 Conduct Needs Analysis
  - 3.3.2 Prepare Objectives
  - 3.3.3 Prepare Criterion Measures
  - 3.3.4 Develop Lesson Plans and Learning Activities
  - 3.3.5 Develop Learning Materials
  - 3.3.6 Obtain Logical Critical Review of Training Program Components and Revise Accordingly

Figure IV.9

Page 2 of 2

- 3.4 Develop Training Program for Test Administrators
  - 3.4.1 Conduct Needs Analysis
  - 3.4.2 Prepare Objectives
  - 3.4.3 Prepare Criterion Measures
  - 3.4.4 Develop Lesson Plans and Learning Activities
  - 3.4.5 Develop Learning Materials
  - 3.4.6 Obtain Logical Critical Review of Training Program Components and Revise Accordingly
- 3.5 Conduct Training for Program Implementation Observations
  - 3.5.1 Arrange for Needed Training Facilities
  - 3.5.2 Conduct Training
  - 3.5.3 Evaluate Effectiveness of Training
  - 3.5.4 Review Evaluation Results and Recommend Termination of Trainees Not Meeting Acceptable Criteria
- 3.6 Conduct Training of Test Administrators
  - 3.6.1 Arrange for Needed Training Facilities
  - 3.6.2 Conduct Training
  - 3.6.3 Evaluate Effectiveness of Training
  - 3.6.4 Review Evaluation Results and Recommend Termination of Trainees Not Meeting Acceptable Criteria
- 3.7 Conduct Training for Classroom Climate Observations
  - 3.7.1 Arrange for Needed Training Facilities
  - 3.7.2 Conduct Training
  - 3.7.3 Evaluate Effectiveness of Training
  - 3.7.4 Review Evaluation Results and Recommend Termination of Trainees Not Meeting Acceptable Criteria

summer school classes, examination of program materials, and viewing of films and video tapes. It is recommended that three classroom observer alternates be included in the training in the event that substitutions need to be made among the 17 selected candidates. While it is not necessary, it is recommended that the training be conducted as part of a program of graduate study for which observers receive graduate credit.

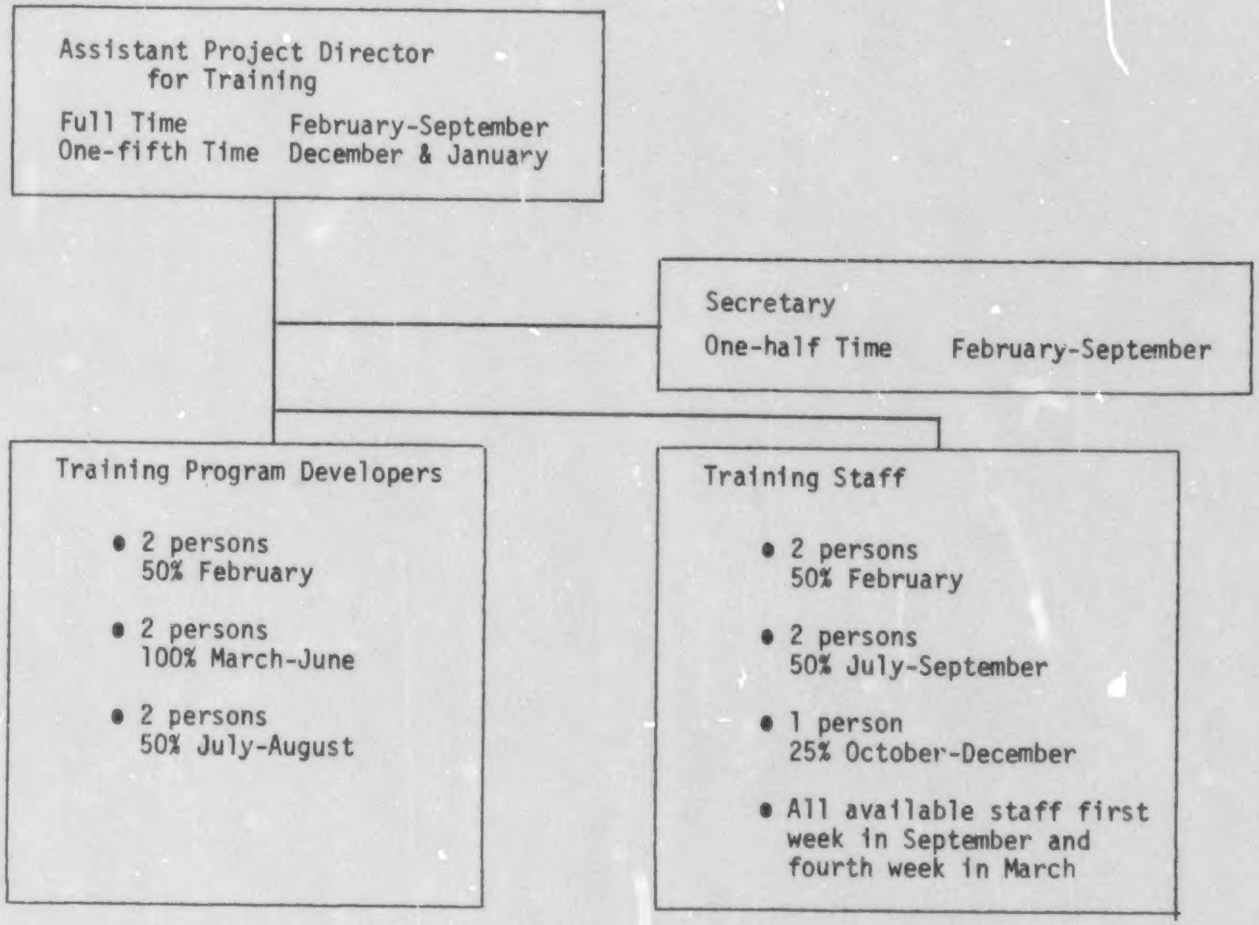
Since the observations of classroom climate will be conducted only during February and March of 1977, the training for the classroom climate observation teams will occur during late November and December of 1976 again culminating with a series of trial classroom observations. The training time required is approximately 40 hours and 20 hours of classroom observation. Again while it is not necessary, it is recommended that training for classroom climate observation be part of a program of graduate study.

The training of test administrators is expected to be a maximum of 4 hours of instruction. Since the test administrators will be from the locale of the test site, training will occur in centralized sites within 25 miles of the test site whenever possible. Training classes for test administrators will be small (5-10) and will be conducted by the classroom implementation observers who will assist in monitoring and administration of pre- and posttests.

The training group will also be responsible for the orientation and training of the screening site consultants. As mentioned earlier, this group will work on a part time basis visiting prospective study sites located in the geographical centers being considered for the study. Since the screening teams will be recruited from university and college of education staffs, and will, as prerequisites for their assignment, be familiar with the notions of individualization, compensatory education, and classroom climate, it is anticipated that orientation and training will be accomplished in three full day sessions which will introduce them to the study and the specific procedures and instruments to be used in the screening process. Training will include several sessions of role playing using video recording and playback equipment. Each consultant team will have at least one opportunity to be taped and critique his or her own tape during the training sessions.

The training organization and staffing requirements are shown in Figure IV.10. The Assistant Project Director for Training will report to the Project Director. The special prerequisites for the developer/trainers would be successful experience in providing in-service teacher training or college teaching in the field of education. Following the completion of all training tasks, the training staff will be reassigned to the Monitoring and Quality Control group in order to provide continual support to observation teams as they perform their field work. This will be discussed further in the Quality Control section.

Figure IV.10. Training Group Organization


Assistant Project Director for Training
Full Time February-September
One-fifth Time December & January
Secretary
One-half Time February-September
Training Program Developers
• 2 persons 50% February
• 2 persons 100% March-June
• 2 persons 50% July-August
Training Staff
• 2 persons 50% February
• 2 persons 50% July-September
• 1 person 25% October-December
• All available staff first week in September and fourth week in March

4. Field Operations Group

The workscope of the Field Operations group constitutes the largest set of activities of the study and consequently involves the most staff. Figure IV.11 shows a time table of the major activities for the Field Operations group with two major sub-divisions: (4.0) Screening and Contracting, and (4.1) Classroom Observation and Data Collection. Because of these functional groupings, the Field Operations group will be organized into two operating groups as shown in Figure IV.12.

a. Screening and Contracting Group

The screening and contracting phase, a most critical period of five months at the beginning of the study, will involve extensive telephone contacts and visits to prospective study sites. The primary concern during the screening and contracting phase is to secure the cooperation of sufficient sites in which to conduct the study. While screening is a major part of the work, the contractor must also emphasize the positive benefits of the study to the prospective participants, be they teacher groups, parent groups, community groups, school principals, school boards, central office superintendents. In this regard, one of the early tasks of the Screening group will be the preparation of various public information brochures designed for several different target groups with varying levels of specificity. Figure IV.13. summarizes the brochures that will be needed.

Figure IV 11. Schedule of Field Operations Group Tasks

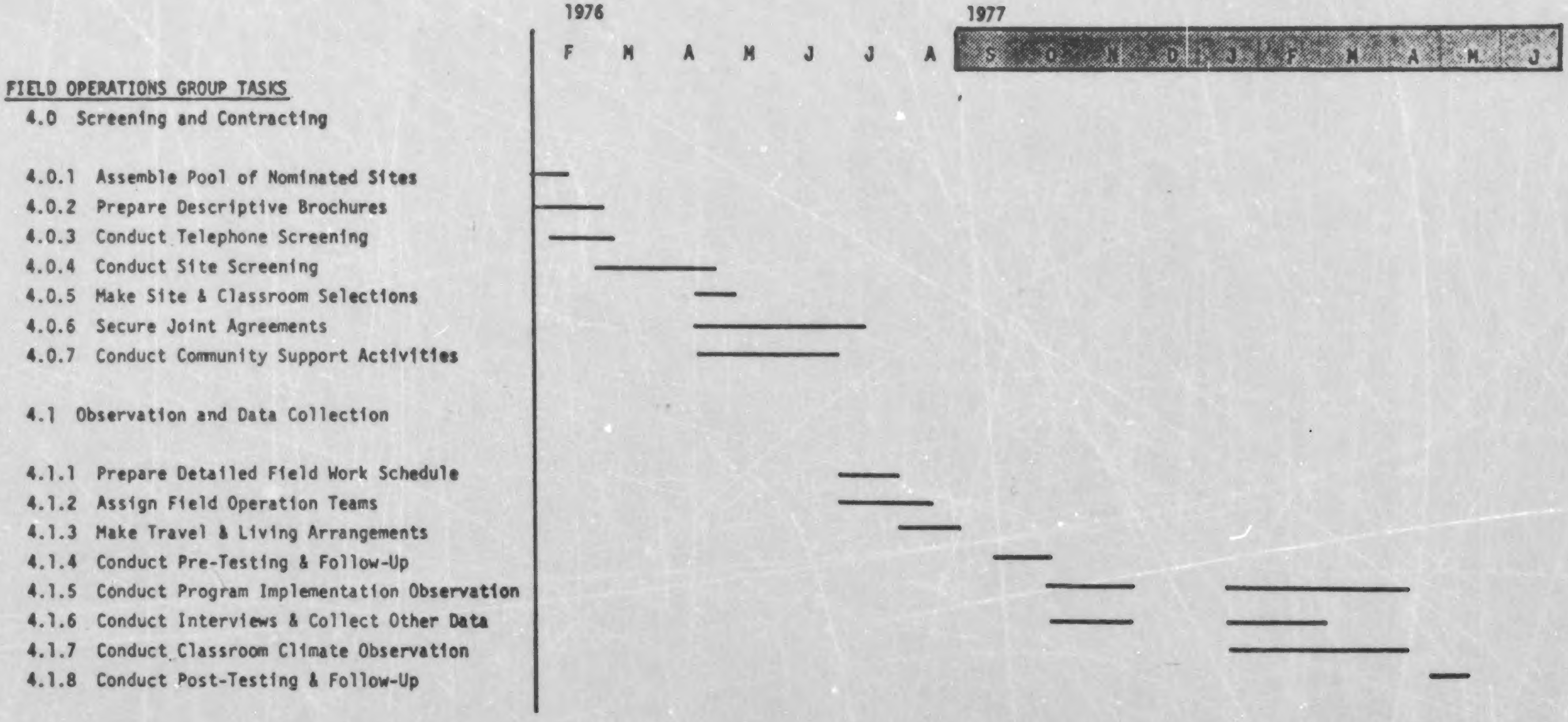


Figure IV.12. Field Operations Organization

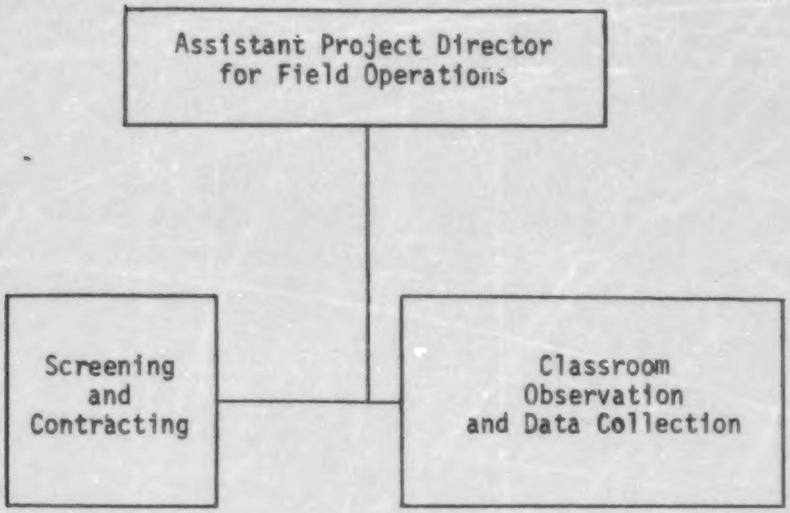

Assistant Project Director
for Field Operations
Screening
and
Contracting
Classroom
Observation
and Data Collection

Figure IV.13. Information Brochures: Designated by Target Group

(1) State Title I Director, District Superintendent, District Central office, Principal

(2) Teacher, Teacher Organization

(3) Community Group, School Boards, General Public Information

(4) School District Research Review Committee (an abstract of the proposal is anticipated here)

The first major screening task will involve identification and plotting of potential study sites on a map. Areas of high concentration will be identified as potential study centers. Because of the logistics and cost problems that would be encountered in a nationwide sampling of schools and also since the NIE has not required a geographical sampling, the screening process will concentrate on identifying sites within a close proximity of each other. Preliminary work with the screening process during the planning phase indicates that several clusters may be possible. One cluster is the northeastern section of the United States centered in the New York, Philadelphia, Washington corridor. A second possible cluster might be centered in the Chicago area, with a third in the Pittsburgh area.

Once the potential study centers have been identified, state ESEA Title I Coordinators will be contacted for the states in which the prospective study centers are located in order to determine per pupil expenditure for compensatory education in each prospective school district. This contact will also serve as a proper protocol contact to inform the state coordinator of the study, the intentions of the contractor, and NIE. Each of these contacts will be made initially by phone or personal visit. Descriptive brochures will be provided in letters of thanks following the contact.

Following this initial contact the screening of individual school districts and sites will begin.

Using a telephone screening process, school districts and schools will be contacted and screened with respect to the remaining screening variables.

Telephone calls will be made initially to the school district central office followed by calls to the individual school principals. In the case where a specific individualized school site has been identified, the call to the district office will be to secure nominations of comparable standardized sites as well as to serve as a protocol step to contacting the identified site. In the case where only a district has been identified as using individualized programs the call to the district office will be to seek nominations and permission to contact individual school principals.

During the contact to the district office, it should be ascertained if the district research policy entails approval of all outside research by a research review committee. The experience with the screening procedure during the planning phase indicates that many of the larger school districts in metropolitan areas have a research review committee which must approve all research studies. In most cases the time to obtain approval is at least 30 days. In order to avoid delaying the screening process, the contractor should make the initial screening contacts to large metropolitan districts at the earliest possible time and submit appropriate requests for approval of the study. This request or proposal will need to contain detailed specifications of all procedures and instruments to be used.

The telephone contacts to the district and the school principal will be done using telephone interview schedules (See Appendix) in which specific questions pertinent to the screening criteria will be asked. Data will be recorded by the interviewer on the interview response sheet for later review.

Because of the heavy reliance on telephone interviews for the screening process the contractor should have secured sufficient Wide Area Telephone Service (WATS) arrangements since it is estimated that as many as 1000 sites would be contacted by long distance telephone during the months of February and early March. (See facilities section on recommended telephone system.) The tryouts of the interview schedule indicate on the average that the time needed is approximately one half hour per screening interview. This will require approximately 500 hours of telephoning by five professional staff persons functioning as telephone interviewers for five hours per day five days a week for four weeks.

Immediately following each initial telephone screening interview a letter of thanks and a descriptive brochure explaining the study and its intended benefits will be sent to the school principal and/or the district superintendent. After reviewing the results of each telephone interview, sites meeting the selection criteria (either individualized or standardized) will be sent a second letter indicating that the site is being seriously considered for inclusion in the study. Also included in the letter will be information describing the study, what specifically it would mean to the local district in terms of obligations, benefits, and incentives.

The results of the phone screening will be reviewed and initial selections will be made for on-site screening. At this point all schools will be notified of their status including those selected for on-site screening and those which have been eliminated. Arrangements will be made for site visits by phone followed by a confirmation letter which will include a packet of materials describing the study, its specific benefits to the school, the teachers and the community. Also included will be an outline of those things to be completed during the site visit; i.e., principal interviews, classroom visitations, teacher interviews, and a meeting with appropriate central office personnel. Outlines of the major points to be discussed in these meetings will be included with a copy of the principal and teacher interview forms.

Screening visits should be considered as having several major purposes: (1) gaining initial interest and support of the school district personnel for participation in the study, (2) gathering needed information for the screening process, (3) obtaining information that would be helpful in assessing the difficulty of obtaining community support should the site be selected, and (4) contacting appropriate district contracting officials to determine the proper procedures for processing the joint agreements in the event the site is selected for the study.

Screening visitations will be scheduled at schools in close proximity and should take at least a full day per school. Visits will be made by teams of two study personnel, one to meet with the principal and administrative staff and the second to visit the prospective classes and to interview teachers. Where multiple potential sites exist in a single district, there may be some savings in time with respect to meetings with central office personnel. However, it is anticipated that this savings in time will be offset in large urban districts by the increased number of central office personnel to be contacted and the number of protocol visits that may be necessary.

Following the site visits, potential sites will be reviewed using the selection criteria and sampling procedures discussed earlier. Following the selections of desired study sites and ultimate sites, all schools visited will be informed of their status by letter. Phone contacts will be made to the first choice study sites and joint agreements will be prepared and sent to the appropriate school officials determined in prior visits to the district central office. The joint agreements will outline the specific obligations of the contractor, the school district, the principals, and the teachers. It will also contain specific data regarding incentive payments for all time spent by district personnel in regard to the study. The mailing of joint agreements will be followed up by calls to facilitate the acceptance of the district approval process. Substitutions will be made from the alternate list whenever a school decides to decline the invitation to participate.

At the first indication of approval by a district, plans for the development of community support will be initiated for the district. This will consist of calls to school-community leaders, PTA's and other influential community groups. Presentations will be made to executive or full group meetings when it seems advisable. This process will continue from April to June and again in September through November of 1976.

It is estimated that as many as 300 screening site visits will need to be made during March and April of 1976. Since the visitations will coincide with spring recesses in many schools, this period will provide only 40 good visitation days (avoiding two days prior to and two days following vacations) which means that on an average about 10 sites will need to be reviewed per day. This will necessitate 15 teams of 2 site visitors making an average of 2.5 visits each week. Several people coordinating visits from the contractor's home office will also be necessary. Site screening teams will need to have sufficient background experience to conduct the screening and be successful in meeting with teachers, administrators, and superintendents. Since they must be able to explain in detail the nature of the study with little training they will need to be a group of people with high quality backgrounds in educational research with experience in supervision of instruction as well as in dealing with teachers and administrators.

The Screening and Contracting group will also need to have several people to handle closing the contractual arrangements with the school districts. This staff will more than likely be the same staff who arranged for visits of the Screening staff. Following the screening visits, several people will need to engage in developing community involvement. These people will more than likely become the classroom observation supervisors during the 1976-77 school year.

b. Classroom Observation, Testing and Other Data Collection Group

The major responsibility of this group will be to schedule and conduct all data collection activities including interviews, testing of students, conducting classroom observations, as well as to collect other pertinent data from school and district records. The first major task of the Classroom Observation and Data Collection group will be the formulation of a detailed schedule of testing, observation, interviews, and other data collection. This task is to be attended to only after joint agreements have been secured with all the districts selected in the study sample. Scheduling will be done in conjunction with the assignment of classroom observation staffs and will take into account available staff resources in an effort to maximize the coverage at a minimum cost for travel and accommodations.

i. Test Administrations- Pretests for all students participating in the study will be administered during the period of September 20 to October 1, 1976 with posttests administered during the period of April 18 through April 29, 1977.

Test administration in the study classes will be conducted by a test administrator working with the assistance of the classroom teacher. The total testing time will be about five hours during the week for each child. Schools using IGE-type (large group) classes will require an additional test administrator. Student test sessions will be kept as short as possible with the test administrator moving from class to class within schools where more than one class is participating in the study. Figure IV.14 shows the testing patterns that will be used subject to minor adjustments due to school requirements.

The test administrator will return to the school during the week following the main testing to test students who were absent from class during the testing.

Prior to pretesting, test administrators will fill in student name and other identification data on answer sheets in order to save time. This will help in identifying absentees

Figure IV.14. Study Testing Patterns

Page 1 of 2

Pretest Regular Size Study Classes

DAYS	1	2	3	4	5	6	7
AM	TR	R	R	M	M	M	M
PM		R	R				

Pretest Large Group Open Education Study Classes

First Test Administrator

DAYS	1	2	3	4	5	6
AM	TR	LG	LG	M	M	M
PM		LG	LG			

Second Test Administrator

DAYS	1	2	3	4	5	6	7	8	9
AM	TR	LG	LG				M	M	M
PM		LG	LG						

Page 2 of 2

Posttest Regular Size Study Classes

DAYS	1	2	3	4	Spring Vacation	5	6	7	8	9	10
AM	TR	R	M	M		R	R	M	M	M	M
PM		R				R	R				

Posttest Large Group Open Education Classes

First Test Administrator

DAYS	1	2	3	4	Spring Vacation	5	6	7	8	9	10	11
AM	TR	LG	M	M		LG	LG	M	M	M		
PM		LG				LG	LG					

Second Test Administrator

DAYS	1	2	3	4	Spring Vacation	5	6	7	8	9	10	11
AM	TR	LG	M	M		LG	LG			M	M	M
PM		LG				LG	LG					

KEY:

TR	Training Session
LG	Large Group Test Session
R	Regular Size Class Test Session
M	Make-Up Test Session

and in the processing of data. Student names will be taken from the teacher's class list.

For posttesting the answer sheets will be pre-printed with all necessary student identification information using a computer printing process described later under the data processing section.

The testing schedule for each class will be reviewed with each classroom teacher and minor adjustments may be made to accommodate assemblies, special teachers or other unanticipated problems. Classroom teachers and aides will be permitted to leave the classroom if they wish during the test administration period however this option will be dependent on the approval of the principal.

ii. Classroom Observations and Other Data Collection- Classroom observations will be conducted during the periods of October 11 through November 19, 1976 and from January 10 through April 1, 1977, a total of 18 weeks. Each classroom will be observed by a single observer for a period of at least 3 hours ten times during the school year. Seven of these observations will be to assess program implementation variables and three to assess classroom climate variables. The classroom climate visitation will include the full school day while the program implementation observation will last about three hours including interview time with the teacher.

The regional liaison coordinators will conduct several classroom observations with each observer to provide a check of the observation reliability. The two person observations will be spread out to provide reliability checks over time as well as checks on the observations for both program and classroom climate variables. The primary assignment of the regional liaison coordinators will be to maintain contact with study sites and to make sure that the detailed schedule of local training, testing, observation and data collection is followed. The coordinator will contact schools before each observation visitation to remind them of the purpose of the visit and to check on the availability of needed personnel or resources. The regional coordinator will be in daily contact with classroom observers during the field observation phases for the purpose of identifying problems and confirming upcoming visits. Coordinators will arrange for rescheduling of visits by observers in the cases of school closing, teacher absence, etc.

Regional coordinators will also be in charge of maintaining liaison and support of community and teacher groups. This may involve making presentations at various meetings to explain the study and its benefits as they relate to the school and the community. Interviews with teachers, principals, and selected parents will also be conducted by classroom observers during observation visits, usually during the afternoon. Data to be gathered from school records such as attendance data and parent occupations will also be gathered by the observers during non-observation time.

While every effort will be made to clear all scheduled visitation dates and to confirm each visit a week before it is to occur, alternative activities will be scheduled in advance whenever possible in case there should be cancellations. These alternative activities will be observations of other study classrooms, collection of student record data, interviews with principals, teacher aides, etc. However, the probability of a successful rescheduling will not be very great particularly where sites are spread out. The success of rescheduling will also diminish as the year goes on and as various alternate activities are completed.

Quality control monitors will work with classroom observation teams in order to solve problems that may crop up in the collection of observational data. The monitors will have conducted the training of the observers and will have developed a good deal of personal rapport with the observers. The observers will meet with the monitors in the centers as a group about once every two weeks to discuss in general their observational and other data collection experiences. The quality control monitors will also periodically visit sites to check the reliability of the classroom observations.

Complete travel and lodging arrangements will be made for field observation teams and quality control monitors as part of the scheduling process. Living accommodations will be made for field workers when an assignment to a study center necessitates relocation. Travel arrangements will be made by the Secretary of the Field Services group with the assistance of a travel agency.

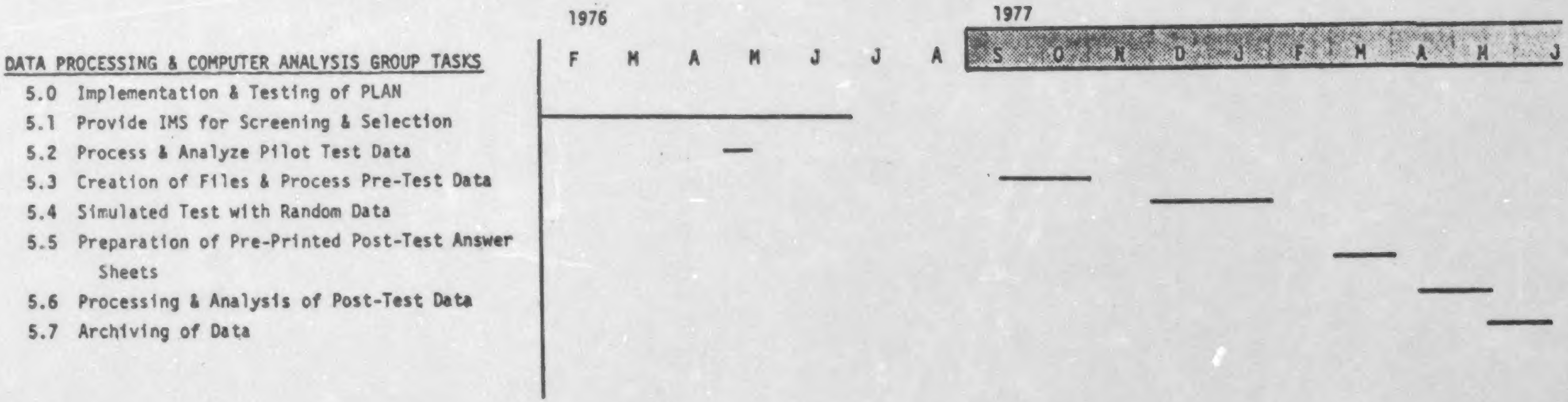
5. Data Processing and Analysis Group

The primary concern of the data processing and analysis group will be to provide accurate computer analyses of all data collected during the study. The schedule of major tasks to be completed are shown in Figure IV.15. The actual procedures to be completed have been discussed in the data analysis section. The highest priority of the data processing analyses will be to complete the total analysis as soon as possible after the completion of posttesting. To accomplish this goal many things will be done earlier in the study in preparation for the final analyses.

During the contract period prior to the 1976-77 school year the planned data processing and analysis plan will be implemented and tested. Since it has been recommended that existing program packages be used, no major programming will have to be done. However it will be necessary to prepare and test sets of job control instructions which define, allocate, and access appropriate computer files; tie together various programs used in the job stream; and indicate the various options to be used in the existing program packages. Some small programs for error checking, file creation, production of file verification lists, and pre-printing of student answer sheets will have to be prepared and tested.

The data from the pilot test will be processed using the same techniques and time frame for the final analysis. While

Figure IV.15. Schedule of Tasks for Data Processing & Computer Analysis Group



the amount of data will be much less, this will be a trial run with real posttest data.

Randomly generated data files of approximately the same size as the files for the total study will be created and run as a simulated test to make sure there are no difficulties in the computer programs, printouts, or the computer processing job stream. Data files will be created and built during the school year with pretest scores, observational data, and interview data entered and verified. All files will be safeguarded using several back-up methods. Since all data will be collected on specially designed, optically read computer scoring sheets, there will be a minimum of coding and key punching. There will be a need to visually scan student answer sheets to make sure answer marks are properly darkened and that erasures are complete. This will be done by test administrators following the completion of each test in order to speed the processing of data at the central computer facility.

During the pretesting, test administrators will enter a specially determined code to identify each answer sheet by school, class, and student. This will be checked against class lists by verification clerks. Test administrators will also fill out an optically read student data sheet for each child for the purpose of creating computer files.

Answer sheets for posttesting will be prepared by computer with the student's name and proper identification codes in order to facilitate the posttesting process and the rapid collection of data. The machine readable pre-printed coding will be double checked with class lists by verification clerks prior to distribution to test sites. The contractor will also take precautions to insure the darkness of the pre-printed codes in order to avoid unnecessary time loss in the processing of posttest data.

The use of pre-printed answer sheets with student identification coding will facilitate the processing of posttest data in several ways, (1) avoid errors in coding of student identification codes, (2) save time in the actual testing process, (3) provide an immediate indicator of absentees to test administrators, and (4) permit entry of data to begin prior to completion of absentee testing.

During the screening and contracting period the data processing and analysis group will provide an interactive computerized information management system to assist in the screening and selection process. The system will keep a record of all contacts to prospective school sites by phone and letter, the basic information obtained in the telephone and site screenings. By use of the system it will be possible to develop summaries and listings of potential sites based upon screening data at any time or to determine which sites would be eliminated. This process will be very useful in determining the best possible sampling scheme from the pool of possible study sites.

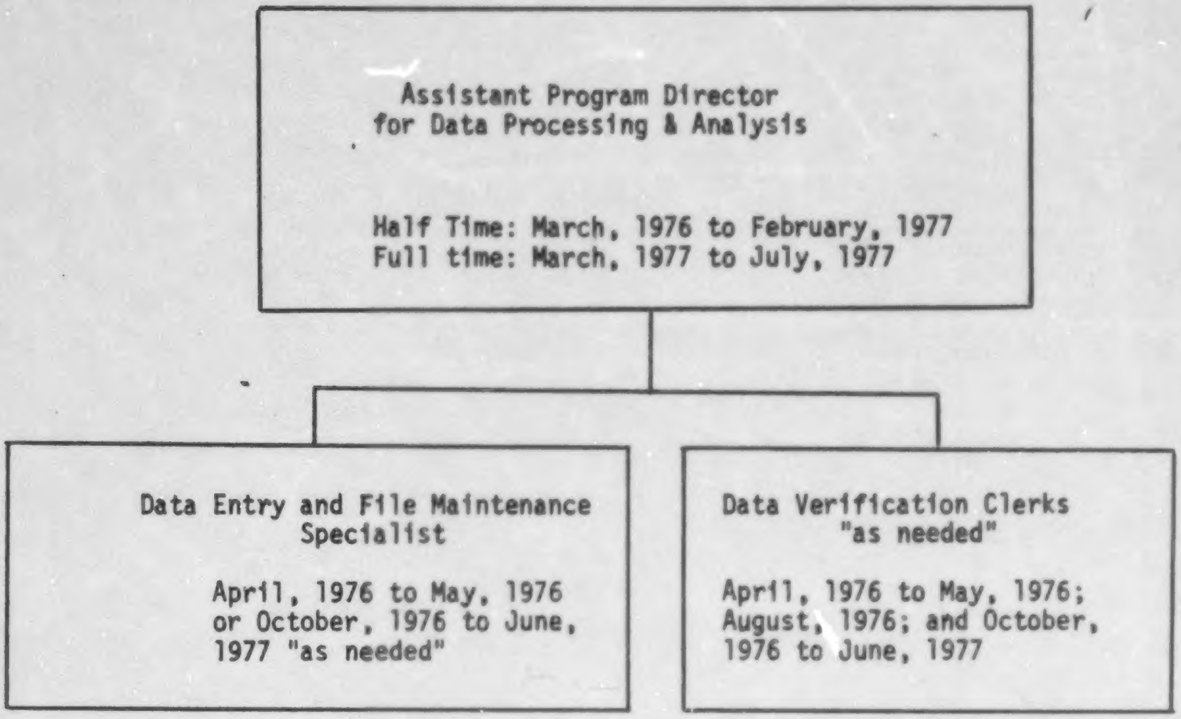
Figure IV.16 shows the organization of the Data Processing and Computer Analysis group. The Assistant Program Director for Data Processing and Analysis will have to be a person with considerable experience in the management of large educational computer data base files. The person should also be competent in the basics of data processing, computer programming, optical scanning, job control languages, and use of interactive management information systems. The person will be responsible for training and supervising the data processing and verification clerks.

Other data processing personnel will be used only on an as-needed basis during the processing of pilot test data, pretest data, observation data, and posttest data with expected peaks during October of 1976 and March through May of 1977.

Other staff needed will be a data entry and file maintenance specialist. This person will be responsible for operation of the optical scanning equipment loading of data into computer files, providing verification check lists, and performing file maintenance and back-up procedures.

The verification clerks will check over incoming optical scanning sheets in preparation for the scanning procedure, perform random comparisons of computer generated verification listings with original source documents, and maintain files of original source documents. They will also verify preprinted answer sheets prior to posttesting and assemble

IV.16. Organization of Data Processing and Data Analysis Group


Assistant Program Director
for Data Processing & Analysis
Half Time: March, 1976 to February, 1977
Full time: March, 1977 to July, 1977
Data Entry and File Maintenance Specialist
April, 1976 to May, 1976 or October, 1976 to June, 1977 "as needed"
Data Verification Clerks "as needed"
April, 1976 to May, 1976; August, 1976; and October, 1976 to June, 1977

complete testing packages for distribution to testing administrators. A senior verification clerk will edit and maintain control over all data documents, tape and disc files. This person will log in all test data as it is received and maintain the system of safeguards.

6. Monitoring and Quality Control Group

The major concerns in providing monitoring and quality control services to the study is to make sure that the study is being carried out according to the intended design and that data being collected is accurate.

The Monitoring and Quality Control group will also work closely with the National Advisory Committee to solicit their criticism and suggestions regarding the implementation of the study, the procedures for conducting it, and development of the final report. The Monitoring and Quality Control group and the National Advisory Committee will be responsible for clearing all study procedures with respect to the protection of human subjects.

An Assistant Program Director in charge of monitoring and quality control will head up the group and will report directly to the Project Director. This person will periodically review the study activities at various check points according to pre-set criterion levels to determine if study activities are being completed on schedule and at a desired level of quality. In the event that quality control checks reveal deficiencies, recommendations for changes in procedures will be made and considered by all project leadership personnel as a matter of highest priority. The tight time line of the study dictates that quality control assessment be attended to on a regular basis and concentrate efforts on preventive measures rather than remedial action.

Some of the more critical areas of concern that will be attended to during the start-up period are the areas of training of test administrators and classroom observers. The Monitoring and Control group will arrange for external reviews of the objectives, procedures, and materials that will be prepared for the training programs. The inter-rater reliability of the observation staff will be assessed in actual or simulated classroom settings as part of the training. The student testing procedures will be tried out and modifications will be recommended as necessary.

During the actual study persons who had developed and conducted the training program will periodically meet with observation teams and test administrators to assess and share solution strategies to common problems that arise. Observation and testing staff will be requested to make problem reports to the Quality Control group whenever unanticipated problems arise that are not handled by standard procedures. These will be reviewed and if warranted discussed with other project staff in order to determine a solution strategy.

The Quality Control group will conduct some field operations but these will be limited primarily because of cost.

Figure IV.17 gives a schedule of major quality control tasks. Figure IV.18 shows the organization of the group.

Most of the staff functioning in the capacity of quality control will be assigned only part time and should not, with the exception of the trainers, have other major assignments to the project in order to provide a greater degree of objectivity.

Figure IV.17. Schedule of Major Tasks for Monitoring & Quality Control Group

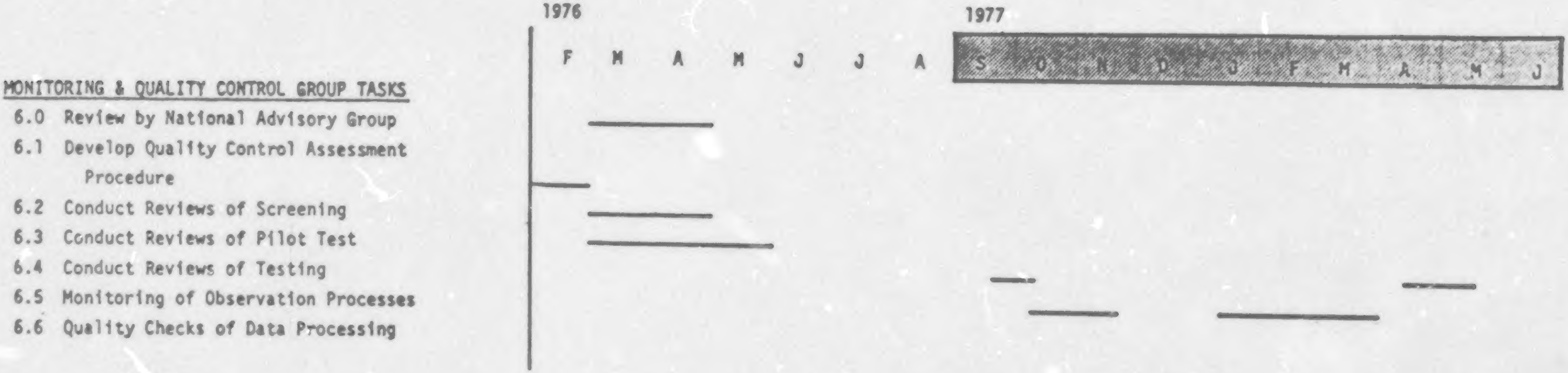
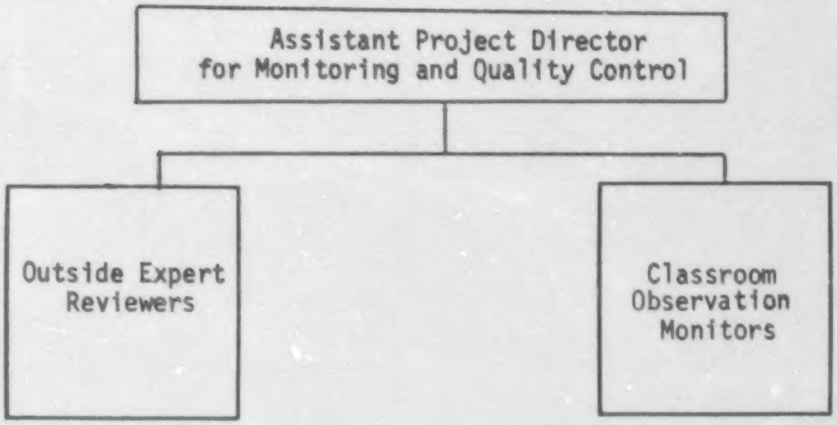


Figure IV.18. Monitoring and Quality Control Organization


Assistant Project Director for Monitoring and Quality Control
Outside Expert Reviewers
Classroom Observation Monitors

IV. LOGISTICAL PLANS

B. LOGISTICAL PLANS FOR AREAS OF PARTICULAR CONCERN

1. External Advisory and Review Processes

There are two major purposes that should be considered for the establishment of a National Advisory and Review Committee. First such a committee can provide expert criticism and advice with respect to the study design, instrumentation, procedures, execution and analysis, and reporting of results. The second reason is to establish that the contractors' design is in compliance with acceptable standards for the protection of human subjects.

Early in the study a group of nationally well-known and respected experts in diverse fields will be invited to serve as a National Advisory Committee to the study. Their first task will be to review the study design, study procedures, and test instruments with respect to the possible risks to students involved in the study. Committee reviews will be conducted with objectivity and in a manner to ensure the exercise of independent judgment of the members. Records of all committee reviews will be maintained and made available to participating school districts as a means of providing assurances regarding the study.

The committee will be concerned with the possibility of risk: physical, psychological, sociological, or other as a consequence of any activity which is associated with the operation of the study. It is the purpose of the Committee to analyze each planned activity to determine that:

- the rights and welfare of subjects are adequately protected
- the risks to subjects are outweighed by the potential benefits
- the informed consent of subjects will be obtained by methods that are adequate and appropriate

During the initial review process of the study design, procedures, and instruments the experts will also reflect on the adequacy of each in attaining the objectives of the study. Should written reviews by the Committee call for any major modifications of the design, instruments or procedures, such changes will be considered immediately by the Project Director and the Research and Implementation committee. A response and recommendation will be prepared and reviewed by the Committee and the NIE project offices. Upon the agreement of the Committee and the NIE the changes will be made. Minor recommendations for change will be reviewed by the Research and Implementation group and necessary action taken subject to approval of the Project Director.

2. Incentives

One of the most pressing logistical problems in conducting the study will be securing the agreement of school districts to participate. This will entail obtaining the support and cooperation of the school principal, teachers, district administration, school board, school/community groups, teacher organization, and parents. In addition to screening sites, study staff will have a large public relations job to convince districts of the benefits of participating in the study. It is anticipated that some districts will be positively influenced by the prestige associated with participating in a large national study, particularly where a district is proud of its accomplishments. However it is expected that while this may be an initial motivation for many districts, it will not be a lasting factor in very many cases.

In order to overcome the possible resistance, the contractor will have to convince the chief school district administrator of the value of the study and also provide assurances that participation will not reflect poorly on the schools or the community. Therefore in considering incentives, the contractor must not only consider positive contributions but avoidance of negative consequences. In this regard, things that will be helpful would be efforts for securing the cooperation of community and teacher groups, assurances that all tests and procedures have been designed to protect the rights of students, assurances that proper safeguards will be taken to preserve the anonymity of student data, and assurances that children will not be harmed in any way by the testing, observation, or interview procedures. Assurances will also have to be given that the contractor will in no instance include specific mention or identification of the school district, schools, or teachers in any reports prepared in association with the project, including data which will be archived.

Some of the positive incentives that would be used would be payments to district personnel for time spent in connection with the study; providing all test results to school districts; and providing presentations about the study upon request to PTA's, teacher groups, etc.

Since the study will use local teachers from the substitute teacher lists to act as test administrators, there are several benefits to the district which may be viewed as incentives. First substitute teachers would be getting training in test administration that will enhance their usefullness to the district. Secondly, since most districts like to maintain good relations with their substitute teachers, the added time and pay for working as a test administrator during periods of time when teacher absence is low (September and April) will be appreciated and help the districts build better relationships with their substitute staffs.

The following is a list of the substantive incentives that would accrue to districts participating in the study:

(a) The use of school district substitute teachers as test administrators during usually slack teacher absence periods will provide additional pay and good will among substitute teacher staffs.

(b) The training and experience of substitute teachers in test administration by the study will provide a new set of skills that may be useful to school districts.

(c) Payments to teachers and principals and other district staffs for their time making specific contributions to the study; i.e., interviews, testing, recording student and instructional data.

(d) A copy of the final study report.

3. Community Involvement

It should be considered essential to secure the cooperation and rapport of parents and school community groups for operating this study in view of the rather intensive testing, observations and interviews that will be conducted. Essentially, parents and community people will have to be assured that the study will not harm or adversely affect the progress of their children, and, in fact, may produce a positive contribution to their well-being by providing information useful for program improvement.

During the early stage of the screening and contracting process, principals and central office administrators will be asked to provide information on local parent and community/school groups. The leaders of these groups will be contacted later in the screening process by letter and with a follow-up telephone call to discuss obtaining their support. Brochures explaining the study will accompany the initial letter. Since communities are expected to be very different it is anticipated that the nature of the reaction to these contacts will be highly variable.

The primary points of the contacts with local parent and community school groups will be: (1) that the group was contacted, ([illegible]) that the study has been described, (3) that limited numbers of parents will be interviewed as part of the study, (4) that the study will not be harmful and may help to bring about improvement in the district. When it seems appropriate representatives of the contractor will offer to make a presentation about the study to interested school or community groups.

4. Professional Support

A potentially difficult problem to overcome with respect to the study would be obtaining and maintaining the support of professional education organizations in the participating districts. To this end, the contractor will need to provide information about the study to the district or school representatives of the teacher organization during the spring of 1976 as part of the screening visitations. This information will describe the intentions of the proposed study with specific requirements and benefits to teachers. The contractor would also solicit comments and suggestions with respect to the study as it affects professional and supports instructional staffs. Study personnel will contact these representatives to follow up the initial contact and solicitation. Should serious problems appear with regard to accommodating the desires and requests of the professional group or union, the use of the district or school would have to be reconsidered in view of the possible adverse effects.

During the school year of the study, it would be suggested that the area regional coordinators in the Field Operations group maintain positive contacts with regard to the study and its progress in order to head off any possible problems before they develop to a union grievance stage.

5. Confidentiality of Data

One of the most sensitive areas involved in conducting evaluations of educational programs pertains to the confidentiality of educational records as specified in what is commonly referred to as the Buckly Amendments. Subsection 6 of the Family Education Rights and Privacy Act, as amended by S. J. Res. 40, indicates that no funds will be made available to any educational institution:

> "... which has a policy or practice of permitting the release of educational records... of students without the written consent of their parents to any individual, agency, or organization other than to the following... (6F) organizations conducting studies for, or on behalf of educational agencies or institutions for the purpose of developing, validating, or administering predictive tests, improving instruction, if such studies are conducted in such a manner as will not permit the personal identification of students and their parents by persons other than representatives of such organizations and such information will be destroyed when no longer needed for the purpose for which it was conducted..."

The procedures of the study will attend to the concerns for privacy of student and parent data by maintaining data in such a manner as not to permit personal identification of students and their parents by other than representatives of the contractor. This will be done through use of a student numbering system for the data files. In order that posttest data be identified with matching student pretest data, a separate student name/number file will be maintained by the Assistant Program Director for Data Processing to be used for the creation of posttest answer sheets. Following the creation of the answer sheets, the file will be destroyed as will all answer sheets and data collection forms following the optical scanning process. In the process of archiving data from the study, all identifiers such as names of schools, districts, teachers, principals, observers, and students, etc. will be removed. While this will not prohibit further analysis, it will protect individuals from identification in future reports.

While it is felt that these procedures meet the spirit and specification of the Buckly Amendments, at this present time no legal decision has been made to clarify the situation: If a participating school district did not feel that these procedures were sufficient and would prefer that parental permissions be obtained, in view of the unsettled legal questions, the contractor would be obliged to collect parental permissions.

The procedures for collecting the parental permission would be rather simple. The contractor would prepare a letter giving a short description of the study along with a parental permission slip. These would be printed at the contractor's expense by the school district and distributed to all children in classes to be studied. The permission slips would have to be returned before the start of testing on September 20, 1976.

C. MANAGEMENT/STAFFING/SCHEDULING

This section presents an overall view of the study from the point of view of task schedules for each of the work groups as well as the scheduling of staff to perform these tasks. At this time the specific assignment and scheduling of tasks has not been brought to the level of detail where specific tasks and subtasks may be assigned to specific positions. This detail will best be completed when specific individuals who will be assigned have been identified. This should occur in the proposal development stage.

Generally, because of the changing nature of the proposed project between the first seven months and the final ten months, the staffing plan attempts to make use of staff over the entire project. This necessitates moving personnel from assignment to assignment several times during the study. However the plans indicate that this concept is not entirely feasible and it appears that some staff positions do not naturally feed into succeeding tasks or positions. It should be recognized that this will create a surplus of highly qualified and highly paid staff at the end of the screening and contracting phase. When possible, these similar positions have been accommodated in the Field Operations group in order to provide continuity; however, the contractor will very possibly have to shift some people to other projects outside this study at the beginning of the field work phase. Figures IV.19 and IV.20 show the overall schedule of study tasks and personnel.

Figure IV.19. Schedule of Study Tasks

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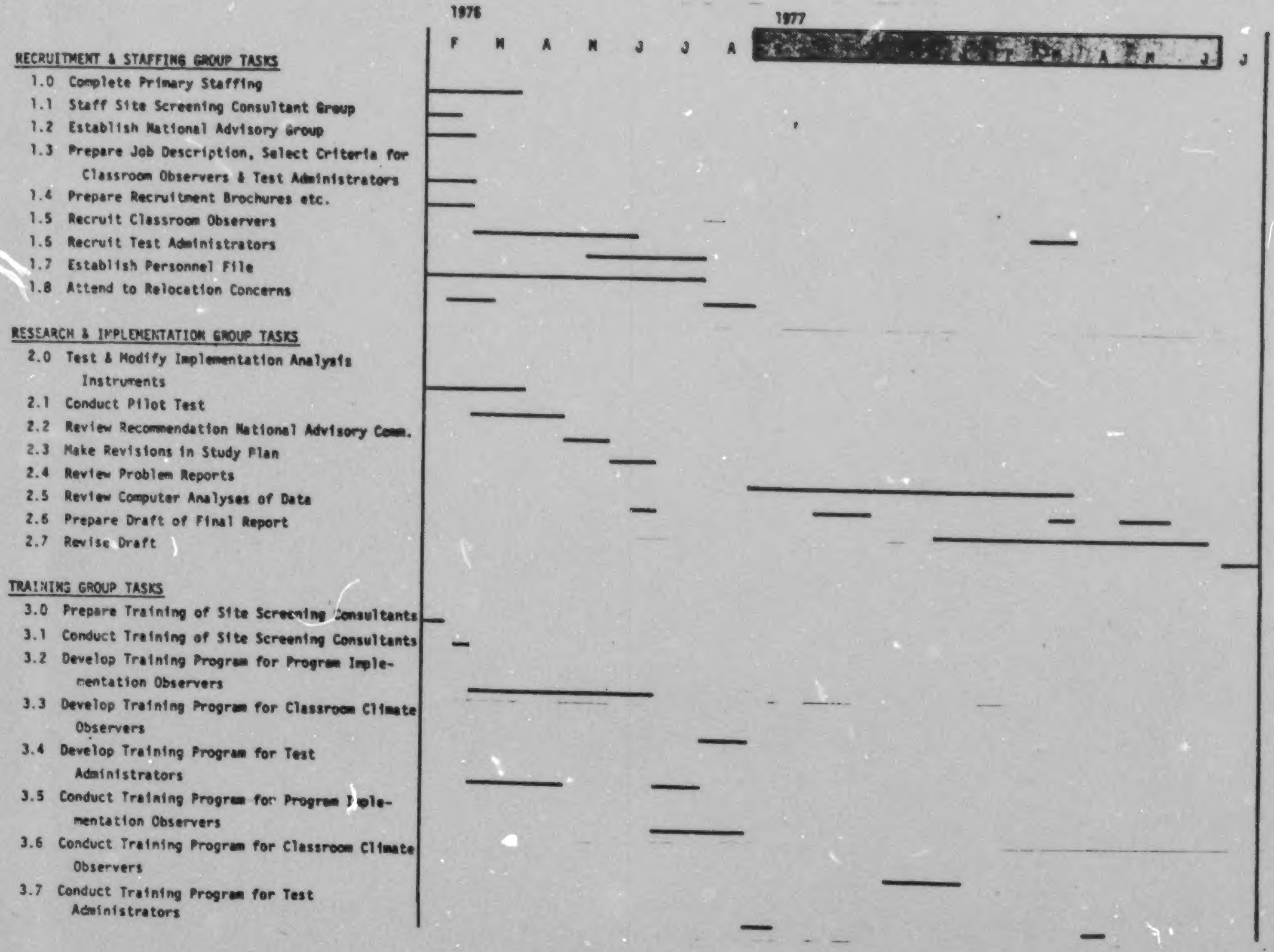

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FIELD OPERATIONS GROUP TASKS

4.0 Screening and Contracting

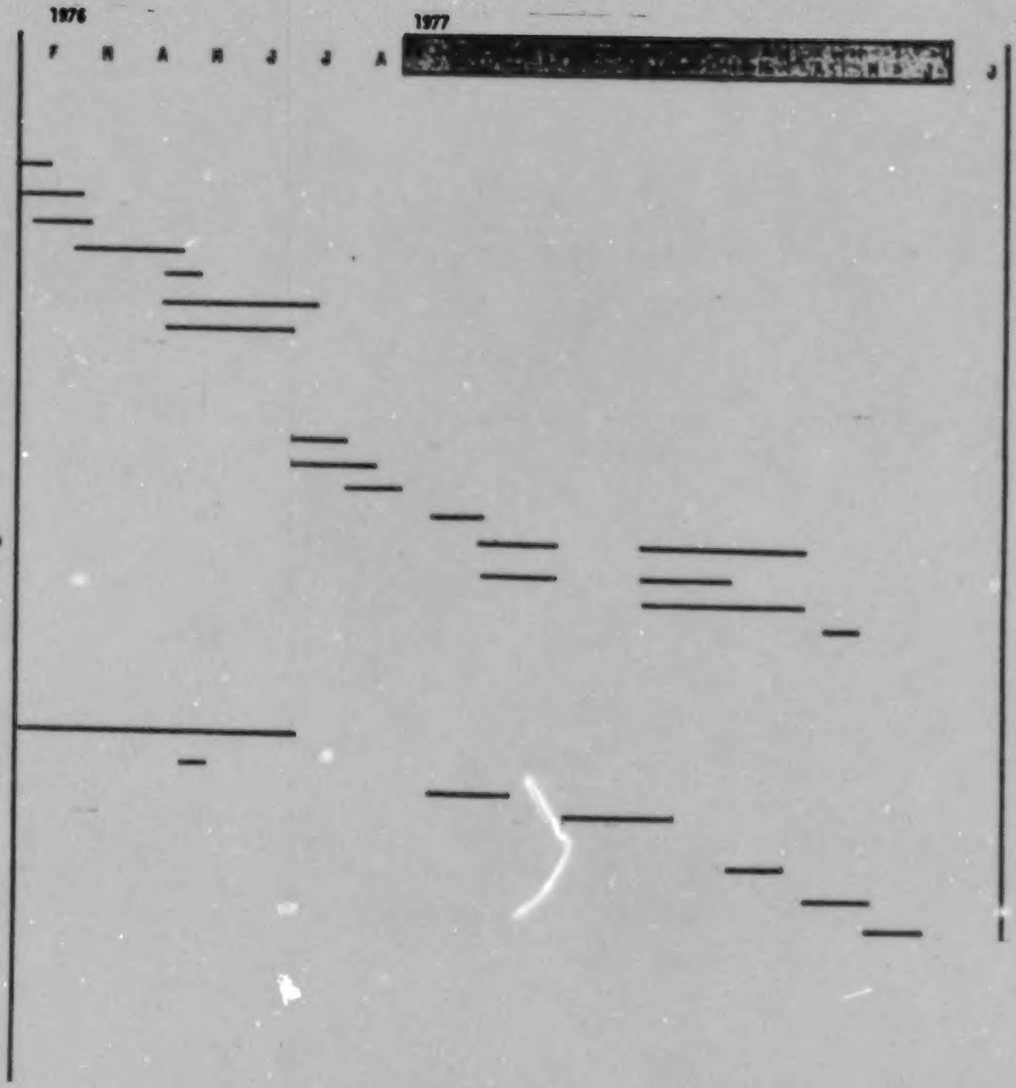
4.0.1 Assemble Pool of Nominated Sites
4.0.2 Prepare Descriptive Brochures
4.0.3 Conduct Telephone Screening
4.0.4 Conduct Site Screening
4.0.5 Make Site & Classroom Selections
4.0.6 Secure Joint Agreements
4.0.7 Conduct Community Support Activities

4.1 Observation and Data Collection

4.1.1 Prepare Detailed Field Work Schedule
4.1.2 Assign Field Operation Teams
4.1.3 Make Travel & Living Arrangements
4.1.4 Conduct Pre-Testing & Follow-Up
4.1.5 Conduct Program Implementation Observation
4.1.6 Conduct Interviews & Collect Other Data
4.1.7 Conduct Classroom Climate Observation
4.1.8 Conduct Post-Testing & Follow-Up

DATA PROCESSING & COMPUTER ANALYSIS GROUP TASKS

5.0 Implementation & Testing of PLAN
5.1 Provide IMS for Screening & Selection
5.2 Process & Analyze Pilot Test Data
5.3 Creation of Files & Process Pre-Test Data
5.4 Simulated Test with Random Data
5.5 Preparation of Pre-Printed Post-Test Answer Sheets
5.6 Processing & Analysis of Post-Test Data
5.7 Archiving of Data



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MONITORING & QUALITY CONTROL GROUP TASKS

- 6.0 Review by National Advisory Group
- 6.1 Develop Quality Control Assessment Procedure
- 6.2 Conduct Reviews of Screening
- 6.3 Conduct Reviews of Pilot Test
- 6.4 Conduct Reviews of Testing
- 6.5 Monitoring of Observation Processes
- 6.6 Quality Checks of Data Processing

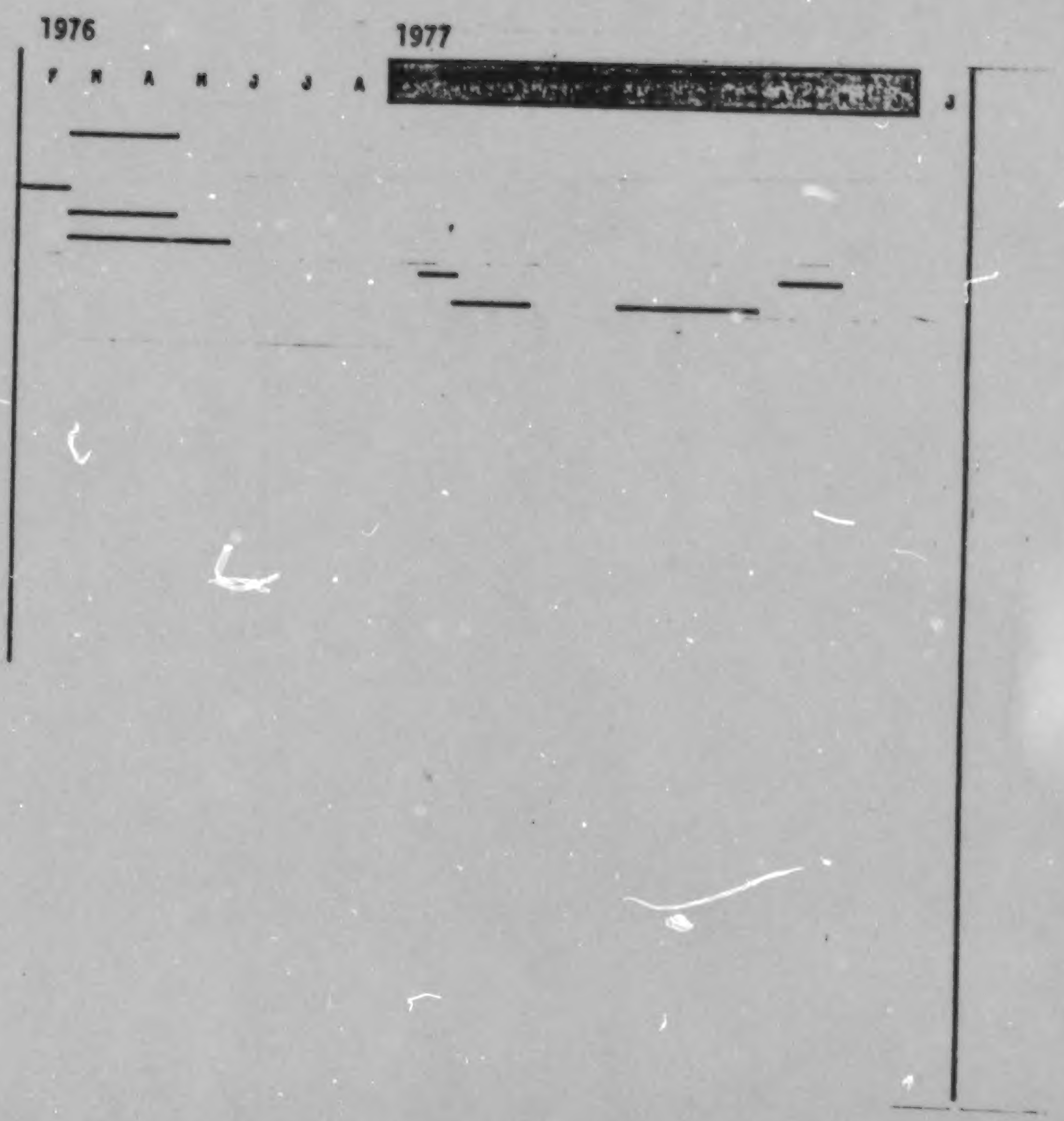

Figure IV.20.

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STAFFING PLAN

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	1976							1977												SALARY			
	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	Total Per Month	Annual Salary	Benefits 19%	Monthly Benefits & Salary	TOTAL COST
Project Director	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	32K	6080	3173	57120
Secretary	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	10K	1900	991	17850
Recruiting & Staffing Group																							
Director	5	.5	.5	.5	.5	.2	.2	To Full-Time Field Operations											2.9	20K	3800	1983	5752
Secretary	1	1	1	1	1	1	1												7	8.5K	1615	843	5900
Interviewers	2	.1/.5	.1/.5	.1/.5	.1/.5	.1/.5	.1/.5												Accumulated from other positions				
Writer	1																		22/dy	$100/ day			2200
Research & Implementation Group																							
Experts #1- Individualized Instruc.	1	1	1	1	1	1	1	1	1	.2	.2	.2	.5	1	1	1	1	1	15.1	30K	5700	2975	44923
#2- Research Methodology	1	1	1	1	1	.5	.5	.5	.5	.2	.2	.2	.5	1	1	1	1	1	13.1	30K	5700	2975	36615
#3- Compensatory Education	.5	.5	.5	.5	.5	.5	.5	.5	.5	.2	.2	.2	.5	1	1	1	1	1	10.6	30K	5700	2975	31535
Training Group																							
Director	1	1	1	1	1	1	1	1			.2	.2							8.4	25K	4750	2479	20825
Secretary	.5	.5	.5	.5	.5	.5	.5	.5											4	8K	1520		3173
Developer/Trainer #1	1	1	1	1	1	.5	.5	.5											6.5	18K	3420	1785	11603
#2		1	1	1	1	.5	.5	.5											6.5	18K	3420	1785	11603
#3							1				.75	.25							2	18K	3420	1785	3570
#4							1				.75	.25							2	18K	3420	1785	3570
Test Trainers #1-14								.25 x 14							.1x14				See Classroom Observers				
Field Operations Group																							
Director	.5	.5	.5	.5	.5	.8	.8	1	1	1	1	1	1	1	1	1	1	1	15.1	25K	4750	2479	37435
Screening & Contracting Group Leader	1	1	1	1	1	.5													5.5	20K	3800	1983	10937
Phone Interviewers #1-5	5	5	To Contracting Assistant & Community Liaison																10	18K	3420	1785	17850
Secretary #1	1	1	1	1	1														6	9K	1711	893	5360
#2	1	1	1	1	.5														4.5	7K	1330	694	3124
Screening Consultants Type A @$100		150	150																300 days @ $100				30000
Screening Consultants Type B @$50		150	150																300 days @ $50				15000
Contracting Assistant #1			1	1	1														3	18K	3420	1785	5355
#2			1	1	1	To Regional Coordinators													3	18K	3420	1785	5355
Community Liaison #1			1	1	1														3	18K	3420	1785	5355
#2			1	1	1														3	18K	3420	1785	5355
Writer	1																		$22/dy	$100/day			2200
																				SUBTOTAL			$399,535

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	1976							1977											SALARY				
	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	Total Per Month	Annual Salary	Benefits 19%	Monthly Benefits & Salary	TOTAL COST
Classroom Observers & Data Collection Group																							
Regional Coordinators #1-4						4	4	4	4	4	4	4	4	4	4	4	4	4	48	See Costing Parameters			95200
Classroom Observers #1-17						20*	20*	7	7	7	7	7	7	7	7	7(v)				See Costing Parameters			231500
Secretary #1							1	1	1	1	1	1	1	1	1	1	1		11	9K	1711	893	9823
#2						.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	6	7K	1330	694	4164
Test Admin.- Study Classes		SEE Costing Parameters																					44280
Data Processing & Analysis Group																							
Director	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	1	1	1	1	1	11.5	20K	4750	1983	22805
Data Entry Specialist				.25	.25			.5	1	.25	.25	.25	.25	.25	1	1			5.25	14.2K	2708	1413	7420
Data Coordinator								1	1	1	1	1	1	1	1	1	.5		9.5	12K	2280	1190	11305
Verification Clerks #1								.25	.50					.5	.5	.5			2.25	8K	1520	793	1784
#2								.25	.50					.5	.5	.5			2.25	8K	1520	793	1784
#3								.25	.50					.5	.5	.5			2.25	8K	1520	793	1784
Monitoring & Quality Control Gr.																							
Director	1	1	.25	.25	1			.5	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	6.5	20K	4750	1983	12890
Observation Monitor #1									.2	.2		.1	.1	.1					.7	18K	3420	1785	1250
#2												.2	.2	.2					.6	18K	3420	1785	1071
National Advisory Board (6 members)																			24 days @ $200/day				4800
																			400 days @ $25/day				10000
Teacher Interviews																			100 days @ $50/day				5000
Principal Interviews																			50 days @ $50/day				2500
Central Office Interviews																			416 days @ $25/day				10400
Parent Interviews																			500 days @ $50/day				25000
Teacher Time																							
																			TOTAL 288 person months in-house staff				
																			SUBTOTAL page 2				504,88
																			TOTAL PERSONNEL				$ 954,39

* Includes three (3) alternates during training

(v) Vacation time

IV. LOGISTICAL PLANS

D. FACILITIES

The facilities necessary to perform the proposed study consist of the following basic needs:

- Office Space and Equipment
- Wide Area Telephone Service Telephone System
- Optical Scanning Facilities
- Computer Facilities
- Printing/Reproduction Facilities
- Training Facilities
- Video Recording and Playback Equipment

This section discusses the basic facilities needs for the study with suggested means of providing them.

1. Office Space and Equipment

The need for office space is generally based upon the number of full-time employees assigned to a project. In this case, due to the extensive number of staff which will be working in the field for extended periods of time, there is a reduced requirement for office space during the school year. It is anticipated that during the first seven months of the project that about 22 staff personnel will be working requiring about 2100 square feet while during the school year only 1500 square feet will be needed.

The estimated computations for office space are as follows:

February to August:	2700 sq. ft. x $9.24 per sq. ft. x 7/12 year =	$14,553
September to July :	1200 sq. ft. x $9.24 per sq. ft. x 13/12 year =	$12,012
	TOTAL RENT. . .	$26,565

In addition to floor space the contractor will need standard office equipment including desks, chairs, tables, typewriters, bookcases and cabinets.

2. Wide Area Telephone Service Telephone System

Because of the heavy emphasis on the use of the telephone for screening purposes and because the proximity of proposed sites covers the United States east of the Mississippi River, it seems that the contractor should give serious consideration to Wide Area Telephone Service to reduce the cost of the screening and other field operations. To this end Figure IV.21 contains an example breakdown of a recommended telephone system designed to provide for heavy use during February and March of 1976. This service will then be reduced to one intra-state and one within-state line for the remainder of the study. It is also estimated that the contracting corporation would arrange to share the phone line and cost for concurrent projects.

For purposes of comparison, it is estimated that during February and March 2000 long distance screening phone calls will be made at an average cost of $5.50 per call, a total of $11,000. The comparable cost for a shared WATS system during February and March would be $6,426.

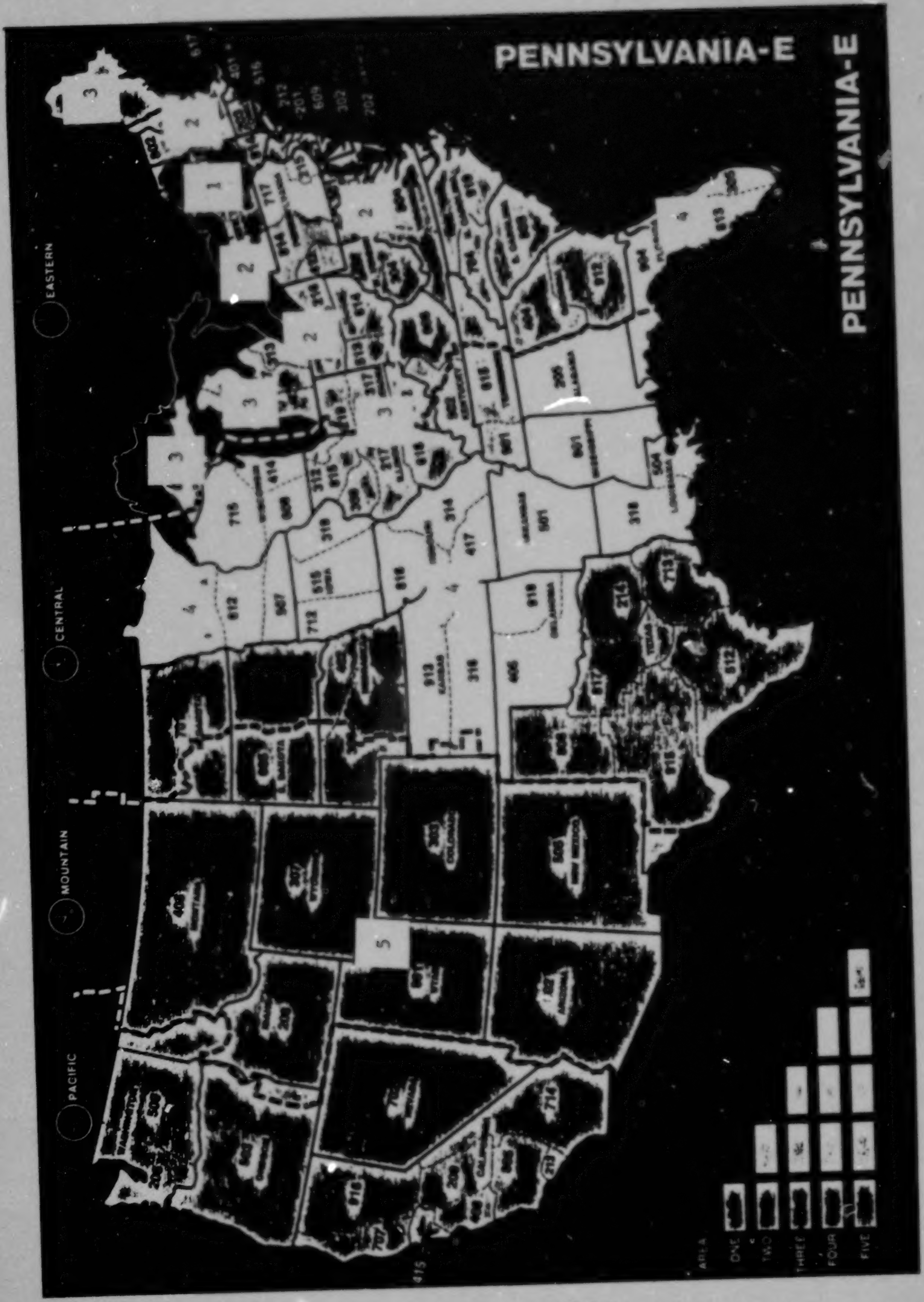
It should be pointed out to the NIE that if the contractor does not have WATS service, an order for such service will have to be placed with the telephone company by December 1, 1975 in

Figure IV.21. Telephone Service Cost Example for Wide Area Telephone Service

Line	WATS Zones	Monthly Rate	Return WATS
1	4	$ 1595	$238/month
2	3	1530	
3	2	1145	
4	9 (Penna. only)	577	

Needed Service by Month 4

	Lines 1	2	3	4	Return WATS	Total WATS Per Mo.	Local Service and Instruments	Less Sharing Contribution from Other Contractor Projects	TOTAL
Feb.	X	X	X	X	X	$ 5085	$ 300	$ 1203	$ 4182
March	X	X	X	X	X	5085	↓	↓	4182
April	X		X	X	X	3555	↓	↓	2652
May thru April	X X			X X	X X	2410 ↓	↓	↓	1507 x 12 mos. ↓
May June July	No WATS Service					0 ↓	↓	0 ↓	300 x 3 mos. ↓ $ 30,000


PENNSYLVANIA-E
PENNSYLVANIA-E
EASTERN
CENTRAL
MOUNTAIN
PACIFIC
AREA
ONE
TWO
THREE
FOUR
FIVE
1
2
3
4
5

order to have the WATS system installed in time for its major use, the screening.

3. Optical Scanning

Due to the heavy volume of test scoring and other data collection which must be accomplished during the study, use of an automated test scoring system seems essential. For this reason the contractor should have access to an optical test scoring device such as an Op Scan Model 100 DM system which has a scanner and magnetic tape unit. The contractor should also provide for back-up scanning capability should the primary facilities be inoperable during the peak post-testing period in the last week of April and first week of May, 1977.

4. Computer Facilities

The computer capabilities recommended for the program would be best provided by a large scale multi-processing system such as an IBM System 370 Model 168 or Control Data Model 6800. Such a system should have a complete set of social science research software packages such as UMAVAC, SPSS, BMD, SOUPAC, etc. The system should also provide large on-line files as well as tape drives, disk packs, and high speed printer all of which are standard at most large research computer centers. Should the contractor not have this installation on premises, a remote keyboard terminal with high speed printing capability should be considered.

5. Printing and Reproduction

The contractor should have access to duplication and printing facilities to produce the various brochures, test books, training materials, and reports required for the study.

6. Training Facilities

At several times during the study, the contractor will need to provide training to large and small groups. Because of the relatively short duration of the training period for large groups, the screening consultants (3 days) and the test administrators (1/2 day in the fall and 1/2 day in the spring), temporary arrangements can be made for large meeting facilities. The contractor should be able to conduct other training in medium sized meeting rooms.

7. Video Recording and Playback Facilities

For the purposes of training study staff in the skills of interviewing, classroom observation and screening a small black and white video system will be highly desirable. Such a system should be portable in order to make the classroom tapes and also be capable of playing tapes made on other standard video systems.

E. FINANCIAL PLAN

This section contains general cost estimates for conducting the proposed study. The pricing has not been done at a detailed level on some items because of the minor nature of their contribution to the total cost of the study. The costs which have been estimated are adjusted in terms of inflation for what one might reasonably expect to pay during the actual contract period. This assures a moderate rate of inflation of around 8% per year; a rate based upon the increase in the National Consumer Price Index for all consumer items over the past six months reported by the United States Department of Labor in Monthly Labor Developments, September, 1975.

The parameters for the pricing are explained as the rationale for the budget summary appearing in Figure IV.22.

Figure IV.22. Budget Summary

Salary and Benefits Consultants	$ 904,395
Travel and Lodging	208,040
Telephone	30,000
Rent	26,565
Computer Processing	15,000
Optical Scanning Forms and Scanning Costs	8,000
Miscellaneous (2% of $663,000 Basic Salary Cost)	13,000
Printing	10,000
Supplies (1.4% of Basic Salary Cost)	9,000
	1,224,000
Overhead (18.4% of Total)	276,000
	$ 1,500,000

Costing Parameters

A. Classes to be studied in depth

1. Number of classes

   74 standard-sized classes
   30 large or open-classroom

2. Location

   Assume all classes will be located in a minimum of 20 districts located in or near urban centers east of the Mississippi River.

3. Testing

   (a) All testing will be conducted by a Test Administrator and the classroom teachers.

   (b) Test Administrators will be trained and paid by the contractor.

   (c) Testing will be spread out in time so that children will not experience long testing sessions (longer than one hour without a break).

   (d) Make-up testing sessions for absentees will be conducted by the Test Administrator who will work several half days following the testing for this purpose.

   (e) Two Test Administrators will be used for large or open education settings with at least two other teachers present.

   (f) Pre-testing: Five hours of testing per class will be administered over 2 days during the last two weeks of September (September 20 to October 1, 1976) with provision for four half days for make-up tests.

   (g) Post-testing:

      (1) Criterion-Referenced tests: Two hours of testing per class administered during the last week of March or first week of April

(March 20 to April 17) depending on scheduling of spring vacation.

(2) Achievement and affective measures: Four hours of testing per class administered during the last two weeks of April (April 18-29) depending on scheduling of spring vacation.

4. Classroom Observations

(a) Program Implementation: Six class visits spread evenly during school year (September 20 to March 19, 1976 and January 10 to April 1, 1977). One observation will be done by two observers. Observations of large or open classrooms by two observers and a classroom observer and an area coordinator. (Observers will observe an average of four days per week with one day per week for making arrangements, conducting interviews, or travel.)

(b) Classroom Climate: Three class visits during the period of January through March, 1977. One visit will be done by two observers, a classroom observer and an area coordinator. Observation for classroom climate will last an entire school day.

B. Staff Requirements

1. Classroom observers

(a)	Number of observations--	1206
(b)	Available school observation time--	18 weeks
(c)	Average number of observations per week--	4
(d)	Number of observers needed--	17
	(1206 ÷ 18 ÷ 4 = 16.75) $1200 per mo. Average Sal. & Benefits for 11 mos.--	$224,400

(e) Alternate classroom observers 3 observers for 2 months at $1200 per month	$ 7,200
TOTAL CLASSROOM OBSERVERS	$ 231,600
2. Area Coordinator	
(a) Number of observations--	208
(b) Available school observation time--	18 weeks
(c) Average number of observations per week--	2.2
(d) Number of area coordinators-- 208 ÷ 18 ÷ 3.0 ÷ 3.85 $1983 per mo. average Sal. & Benefits for 12 mos.--	4 $ 95,200
3. Test Administrators	
(a) Pretesting Study Classes (9/20 - 10/1)	
(1) 37 Test Administrators for standard classes: 11 half days @ $22.50 per half day (1/2 day training, 5 half days testing, 5 half days for make-up tests)--	$ 9,157.50
(2) 60 Test Administrators for open classes: 8 half days @ $22.50 per half day (1/2 day training, 5 half days testing, 3 half days for make-up tests)--	10,800.00
(b) Posttesting Study Classes: 37 Test Administrators for standard classes work 13 half days @ $22.50--	10,822.50
60 Test Administrators for open classes work 10 half days @ $22.50--	13,500.00
TOTAL TEST ADMINISTRATORS	$ 44,280.00

C. Travel Requirements Field Operations

1. Rental of 17 compact cars @ $420 per mo. for seven months--	$ 49,980.00

2. Gas Costs: 2000 miles per mo. for 7 mos. @ 20 MPG @ $.70 per gal. for 17 cars--	$ 8,330
3. Other car rental for Area Coordinators 300 days @ $75 per day--	22,500
4. Lodging per diem	
(a) 118 days in central location for training of 17 observers @ $25 per day--	50,150
(b) 2 days per week for 22 weeks @ $35 for 17 observers during school observations	26,180
(c) Area Coordinator lodging 40 days @ $35 for 4 coordinators	5,600
5. Travel to and from study centers	
17 observers: 8 trips @ $150--	20,400
4 coordinators: 10 trips @ $150--	6,000
6. Test Administrator travel for training 2 trips @ $25 for 75 observers	3,750
7. Travel for screening consultants (300 visits at $25 each)	7,500
8. Travel and lodging for training Screening Consultants (30 trips x $150 + 30 x 3 days x $35)	7,650
TOTAL TRAVEL AND LODGING	$ 208,040

F. REPORTING

Because of the tight time line of the proposed study, there will be a need to keep the reporting process as efficient as possible. For this reason the proposed interim or milestone reporting formats are designed to be as brief and inexpensive as possible. Figure IV.23 contains a list of proposed milestone reports.

Figure IV.23. Proposed Milestone Report

Page 1 of 2

DATE	MILESTONE	DESCRIPTION
3/30/76	A	(1) List of programs having claims for providing individualized reading and/or math for elementary grades (K-6)
		(2) Listing of programs qualifying as individualized on the basis of initial screening with summarized results of screening
		(3) Summary of recruiting activities to date
6/30/76	B	(1) Summarized results of pilot test
		(2) Training program documents
		(3) Summary of recruiting and staffing activities
		(4) List of nominated school sites with results of screening indicated
		(5) Validated observation instruments and procedures, interview schedules, tests and test time procedures
10/30/76	C	(1) Listing of participating schools
		(2) Summarized results of pretests
1/30/77	D	Summary of Fall implementation observations and data collection
5/30/77	E	Summary of Spring classroom climate and implementation observation data collection

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DATE	MILESTONE	DESCRIPTION
6/30/77	F	Draft of Final Report
7/30/77	G	(1) Final Report (2) Computerized data tapes

V. APPENDIX

A. INSTRUMENT AND DATA CLASSIFICATION SCHEME

1. Study Question 1
2. Study Question 2
3. Study Question 3
4. Study Question 4

Instrument and Data Classification Scheme

Study Question 1

SOURCE	ANTECEDENTS	TRANSACTIONALS	OUTCOMES
Learner	Lorge-Thorndike Intelligence Test (LTIT) *Student Data Collection Form (SDCF)		California Achievement Test (CAT) National Assessment of Educational Progress (NAEP) My Class Inventory (MCI)
Teacher			
Program	* Teacher Questionnaire- Screening (TQ-S) * Classroom Environment- Screening (CE-S) * School District Interview Form (SDIF) * School Interview Form (SIF)	Instructional Task Treatment Observation Form (ITTOF)	
Class			
School and Community			

*Data used for screening only

Instrument and Data Classification Scheme

Study Question 2

SOURCE	ANTECEDENTS	TRANSACTIONALS	OUTCOMES
Learner	California Achievement Test (CAT) Reading and Math		My Class Inventory (MCI) Calif. Achievement Test (CAT) Reading and Math NAEP Reading and Math (NAEP) Student Attitude Math (HIFAM) Student Attitude Reading (HIFAR)
Teacher			
Program		Instructional Task Treatment Observation Form (ITTOF)	
Class		Florida Climate and Control System (FLACCS) Global Rating (GR) Teacher Practices Observation Record (TPOR)	

Instrument and Data Classification Scheme

Study Question 3

SOURCE	ANTECEDENTS	TRANSACTIONALS	OUTCOMES
Learner	Lorge-Thorndike Intelligence Test (LTIT) (X1) *Student Data Collection Form (SDCF) (X1) Calif. Achievement Test (CAT) Reading and Math	How I Feel About Mathematics (HIFAM) (X7) How I Feel About Reading (HIFAR) (X7) My Class Inventory (MCI) (X7) *Student Data Collection Form (SDCF) (X6)	California Achievement Test (CAT) Reading and Math
Teacher	*Teacher Questionnaire (TQ) (X3) Educational Scale-VII (ES) (X3)	*Teacher Questionnaire (TQ) (X4/X6) Purdue Teacher Opinionaire (PTO) (X4)	
Program	School Principal's Questionnaire (SPQ) (X2)	Instructional Task Treatment Observation Form (ITTOF) (X5) School Principal's Questionnaire (SPQ) (X5)	
Class		Florida Climate and Control System (FLACCS) (X4/X7) Global Ratings (GR) (X4) Teacher Practices Observation Record (TPOR) (X4) Classroom Description (CD) (X6)	

* Different sets of items from the same instrument are used for different composites

Instrument and Data Classification Scheme

Study Question 4

SOURCE	ANTECEDENTS	TRANSACTIONALS	OUTCOMES
Learner	Lorge-Thorndike Intelligence Test (LTIT) *Student Data Collection Form (SDCF)	How I Feel About Mathematics (HIFAM) How I Feel About Reading (HIFAR) My Class Inventory (MCI) *Student Data Collection Form (SDCF)	Degree of Implementation (*Instructional Task Treatment Observational Form (ITTOF))
Teacher	*Teacher Questionnaire (TQ) Educational Scale-VII (ES)	*Teacher Questionnaire (TQ) Purdue Teacher Opinionaire (PTO)	
Program	School Principal's Questionnaire (SPQ)	Instructional Task Treatment Observation Form (ITTOF) School Principal's Questionnaire (SPQ)	
Class		Florida Climate and Control System (FLACCS) Global Ratings (GR) Teacher Practices Observation Record (TPOR) Classroom Description (CD)	

*Different sets of items from the same instrument are used for obtaining different variables

B. INSTRUMENTATION

1. Forms for Sampling and Selection

School District Interview Form (SDIF)

School Interview Form-Traditional Site (SIF-TS)

School Interview Form-Individualized Site (SIF-IS)

Classroom Environment-Screening (CE-S)
(Rationale for Suggested Classroom Screening Variables)

Teacher Questionaire-Screening (TQ-S)

Revised - 10/24/75

SCHOOL DISTRICT INTERVIEW FORM (SDIF)

District ______________________________

Address ______________________________

State ________________

Telephone # _____-_____-________

Interviewer ________________ Date of Initial Call ___/___/___

Persons Contacted

Name	Position	Telephone # (if different) (Date Called)

Contact Re ________________ Program

Information Source

Hello. My name is ________________. I work for ________________ (contractor's name) in ________________ (contractor's location). We are planning a comparative study of individualized and traditional instructional programs under a contract with the National Institute of Education. The actual study will be conducted in about 100 classrooms nationwide during the 1976 - 77 school year. I have contacted you in order to ask for your help in identifying potential sites for the study. The study is one of several being sponsored by the National Institute of Education to provide information to the Congress for the consideration of new compensatory education legislation. A number of program developers, state and federal agencies have already cooperated with us in identifying individualized programs that are being used in compensatory education settings and are worthy of study.

School District Interview Form (2)

Your district has been identified as one that uses the ________________ program.
(program name)

Question 1: *Is this information correct?* Yes ☐ No ☐

If yes, go to question #2.

If no, probe to determine what is wrong about the information, e.g., the program has been discontinued, wrong program information, wrong district name, etc. If a simple correction is possible, continue with question #2. If the district does not use the named program or some other individualized program, apologize and discontinue call.

Question 2: *How many schools in the district use the ________________ program?*
(program name)

____

Since the study we are planning deals with the use of individualized programs in compensatory education settings, our criteria for the selection of potential sites requires that a school receive ESEA Title I funds.

Question 3: *Are any of the schools that use ________________ program in your district Title I schools?*
(program name)

Yes ☐ No ☐

OR

Is the school that uses the ________________ program a Title I school?
(program name)

Yes ☐ No ☐

If no, probe to see if schools qualify for compensatory education funds. If so, treat as Title I, if not, conclude conversation.

If yes, continue.

School District Interview Form (3)

Question 4: *Of the Title I schools that are using the program, how many use the program at the fourth grade level?*

____

Question 5: *Are there Title I schools in your district that use traditional group paced instruction that would be considered as a good comparison for schools using individualized programs?*

Yes ☐ No ☐

If no, probe to make sure before concluding the survey.

If yes, continue.

The next phase of our identification process requires that we contact principals of potential study schools. We have a number of questions regarding the Reading and Mathematics programs in their particular school. I would like to call the schools in your district that we have been talking about. This contact is only an initial step in our screening process and before we take any subsequent steps in the identification process, should the schools qualify, we would get back to you. Can you give me names of the principal(s) in your district that I should contact? I would also need to have the name of the school and its telephone number.

Principal	Phone #	School	Individualized or Traditional

Thank you for your time. It is greatly appreciated. We will be getting back to you following our contacts to the schools you have mentioned.

Revised 10/23/75

SCHOOL INTERVIEW FORM-TRADITIONAL SITE (SIF-TS)

Principal's Name ______________________ Telephone # ____________

School Name ____

Address ______________________________________

City ________________ State ________________ Zip ________

District Name ________________________________

District Office Contact __________________________

Nominated Site Category ______Traditional______

Interviewer ____________________ Date of Interview ____________

Hello my name is ________________________. I work for

________________ in ________________________.
(contractor's name) (contractor's location)

We are planning a study for the National Institute of Education to study the effectiveness of various reading and mathematics programs that are being used in elementary schools receiving Title I support. The study which will be conducted during the 1976-77 school year will involve about 100 sites nationwide. We are currently involved in the initial screening process for site selection. I have spoken with ______________________________ at your
(name of district office contact)
district's central office and he/she indicated that your school is one that we might consider as a potential study site. As part of our identification process we have developed a short telephone questionnaire that will help us determine if your school meets the basic criteria for the planned study.

School Interview Form-Traditional Site (2)

If interviewer notes resistance to questioning at any time in the interview, add this question: *Is there another time that would be more convenient or is there someone else in your school that might help us?* (Take appropriate action.)

Question 1: *First of all we need to know approximately the number of children attending your school?* ______________

Question 2: *What grade levels does your school serve?* ________________

If grade 4 is not included conclude telesurvey.

Question 3: *Is your school an ESEA Title I School?*

☐ Yes

☐ No If no probe to be certain before concluding survey.

Question 4: *What percentage of the children in your school qualify for Title I funded programs?* ___________%

Question 5: *Do children who qualify for Title I programs receive reading and math instruction in the same classes as non-Title I students?*

☐ Yes

☐ No If no, skip to question #8.

Question 6: *Do Title I children receive additional instruction in reading?*

☐ Yes

☐ No

If yes, ask the following: *Please describe the nature of the additional work? ie individual tutoring, small group work, reading laboratory, etc.*

____

____

Question 7: *Do Title I children receive additional instruction in math?*

☐ Yes

☐ No

If yes, ask the following: *Please describe the nature of the additional work? ie individual tutoring, small group work, math laboratory, etc.*

____

____

____

Question 8: The study we are planning will deal only with children at the fourth grade level. The rest of the questions will only have to do with your program for fourth grade level children. *What are the names of the basic texts or programs that you are using at the fourth grade level in math?* ____________

____

in reading ________________________________

Question 9: *Are your fourth grade classes grouped by ability or are they heterogeneous?*

☐ by ability

☐ heterogeneous

Question 10: *Is the math curriculum used in your fourth grade level specified in terms of behavioral objectives?*

☐ Yes

☐ No

Question 11: *Is the reading curriculum specified in terms of behavioral objectives?*

☐ Yes

☐ No

Question 12: *Do children generally begin work at the beginning of the school year at different places in the math curriculum?*

☐ Yes
☐ No

Question 13: *In reading?*

☐ Yes
☐ No

Question 14: *Does the math program make provisions for individual pacing?*

☐ Yes
☐ No

Question 15: *Does your reading program?*

☐ Yes
☐ No

Question 16: (a) *Do children generally begin a new math topic at the same time?*

☐ Yes
☐ No

(b) *How do teachers decide that the pupils are ready to begin a new math topic?* ______________________________

____

Question 17: (a) *Do children generally begin new material in reading at the same time?*

☐ Yes
☐ No

(b) *How do teachers decide that the pupils are ready to go on to new material?* ______________________________

____

Thank you for your help and responding to this questionnaire. After we have reviewed the results of our initial screening process, we will be in touch with ______________________________

district office contact

with regard to the selection of possible study sites. We hope that you would be interested in participating in the study. Again, thank you for your time.

Revised - 10/24/75

SCHOOL INTERVIEW FORM-INDIVIDUALIZED SITE (SIF-IS)

Principal's Name ______________________ Telephone # ____ - ____ - ____

School Name ______________________

Address ______________________________________

City ______________________ State ________________ Zip ____________

District Name ______________________

District Office Contact ______________________

Nominated Site Category Individualized

Interviewer ______________________ Date of Interview __________

Hellos, my name is ______________________. I work for ______________________
contractor's name
in ______________________. We are planning a study for the National
contractor's location
Institute of Education to study the effectiveness of individualized reading and mathematics programs that are being used in elementary school receiving Title I support. The study which will be conducted during the 1976 - 77 school year will involve about 100 sites nationwide. We are currently involved in the initial screening process for site selection. I have spoken with
__________________________ and he/she indicated that your school is
name of district office contact
one that we might consider as a potential study site. As a part of our indentification process, we have developed a short telephone questionnaire that will help us determine if your school meets the basic criteria for the planned study.

If interviewer notes resistance to questioning at any time in the interview, add this question: *Is there another time that would be more convenient or is there someone else in your school that might help us?* (Take appropriate action.)

School Interview Form-Individualized Site (2)

Your school has been identified as one that uses the ____________________ program.

Question 1: *Is this information correct?* Yes ☐ No ☐

If no, probe to be certain before concluding telesurvey.

If yes, continue.

Question 2: *We would like to know how many years you have been using the ____________________ program?* __________ years

At what grade levels do you use the program? ________

If grade 4 is not included, conclude telesurvey.

Ask question #3 for IGE, I/D/E/A, PLAN or DISTAR.

Question 3: *Is the ____________________ program used for math or reading or both?*

☐ Math only
☐ Reading only
☐ Both

Question 4: *Are there any other individualized reading or math programs in use at your school?*

☐ Yes If yes, *what are the names of other programs and at what grade levels are they used?* (Take notes.)

Program	Grade Levels

☐ No If no, go on to the next item.

Question 5: *What is the approximate number of children attending your school?* __________

Question 6: *Is your school an ESEA Title I School?*

☐ Yes

☐ No If no, probe to be certain before concluding survey.

Question 7: *What percentage of the children in your school qualify for Title I funded programs?*

________%

Question 8: *Is the ________________ program used with compensatory education children at the fourth grade level?*

☐ Yes

☐ No

Question 9: *Do children who qualify for Title I Programs receive reading and math instruction in the same classes as non-Title I students?*

☐ Yes

☐ No If no, skip to question #13.

Question 10: *Do Title I children receive additional instruction in reading?*

☐ Yes

☐ No

If yes, ask the following: *Please describe the nature of the additional work; i.e., individual tutoring, small group work, reading laboratory, etc.*

____

____

Question 11: *Do Title I children receive additional instruction in math?*

☐ Yes

☐ No

If yes, ask the following: *Please describe the nature of the additional work; i.e., individual tutoring, small group work, math lab, etc.*

____

____

Question 12: The study we are planning will deal only with children at the fourth grade level. The rest of the questions will only have to do with your program for fourth grade level children. *Are your fourth grade classes grouped by ability or are they hetergeneous?*

☐ by ability

☐ heterogeneous

Question 13: *Is the math curriculum used in your fourth grade level specified in terms of behavioral objectives?*

☐ Yes

☐ No

Question 14: *Is the reading curriculum specified in terms of behavioral objectives?*

☐ Yes

☐ No

Question 15: *Do children generally begin work at the beginning of the school year at different places in the math curriculum?*

☐ Yes

☐ No

Question 16: *In reading?*

☐ Yes

☐ No

Question 17: *Does the math program make provisions for individual pacing?*

☐ Yes

☐ No

Question 18: *Does your reading program?*

☐ Yes

☐ No

Question 19: (a) *Do children generally begin a new math topic at the same time?*

☐ Yes

☐ No

(b) *How do teachers decide that the pupils are ready to begin a new math topic?* ______________________________

____

Question 20: (a) *Do children generally begin new material in reading at the same time?*

☐ Yes

☐ No

Question 20: (b) *How do teachers decide that the pupils are ready to go on to new material?* ______________________________

____

Thank you for your help and responding to this questionnaire. After we have reviewed the results of our initial screening process, we will be in touch with ________________________ with regard to the selection of possible
district office contact
study sites. We hope that you would be interested in participating in the study. Again, thank you for your time.

Classroom Environment-- Screening (CE-S)

R. S. Soar
R. M. Soar

1. What proportion of the affect expressed by pupils in the classroom is negative?

almost none	about 1/4	about 1/2	about 3/4	almost all

2. What fraction of the time do pupils make it necessary for the teacher to resort to commands and criticism to maintain order?

almost none	about 1/4	about 1/2	about 3/4	almost all

3. How much of the school day does the typcial pupil spend on structured learning tasks, either alone or in a group?

almost none	about 1/4	about 1/2	about 3/4	almost all

4. How much of the school day does the typical pupil spend on tasks assigned by the teacher, in contrast to tasks in which he has some choice?

almost none	about 1/4	about 1/2	about 3/4	almost all

5. How much of the school day does the typical pupil spend working alone?

almost none	about 1/4	about 1/2	about 3/4	almost all

Classroom Environment-- Screening (2)

6. How much of the teacher's classroom management conveys accepting, valuing and respecting individual pupils?

almost none	about 1/4	about 1/2	about 3/4	almost all
/	/	/	/	/

7. In what proportion of activities is the typical pupil permitted to whisper or talk to other pupils?

almost none	about 1/4	about 1/2	about 3/4	almost all
/	/	/	/	/

8. After finishing one activity, how many minutes does the typical pupil have to wait for the next activity to begin?

1 or less	3	6	9	12 or more
/	/	/	/	/

9. On the average, what proportion of pupils seem interested or involved in the ongoing activity?

almost none	about 1/4	about 1/2	about 3/4	almost all
/	/	/	/	/

Rationale
for
Suggested Screening Variables

The rationale on which the screening ratings are based is two-fold.

First, they are ratings for which low inference measures already exist in present observation instruments, with varying degrees of parallel for all but one (the eighth). This choice was made because of the wish to be able to relate these rating measures from District Survey I to observation measures which would be obtained as part of District Survey II. The decision to avoid high inference observation measures is based on the difficulty of knowing what behaviors they represent. For example, Rosenshine and Furst (1973) identify Clarity as an important variable in teacher effectiveness, but then comment, "Unfortunately, it is not clear just what is meant by clarity, and future investigators might well attempt to determine the more specific behaviors which comprise a high rating on clarity." (p. 156). While it is true that an individual researcher might train observers to criterion reliability with high inference measures such as Clarity or Enthusiasm, this leaves untouched the difficulty of whether variables with the same names used by other researchers would measure the same behaviors. In addition, the problems of implementing such variables in training programs or by individual teachers in improving their own teaching are formidable. For these reasons, the proposed screening variables are ones which we believe can be tied to low inference measures in existing observation instruments.

Beyond this, first of all, ratings were selected for which there is some empirical evidence of relation with pupil outcomes, or secondarily which represent current beliefs about effective teaching. For example, the ratings which reflect the time the pupil spends on structured learning tasks seem related to the variable Student Opportunity To Learn Criterion Material which Rosenshine and Furst identify as important, with additional support from Soar (1973) and Stallings (1973).

The measures which reflect the emotional climate of the classroom in terms of both teacher and pupil behavior seem related to the variable Criticism cited as important by Rosenshine and Furst. In addition, work by Soar and Soar (1973) and Brophy and Evertson (1974) agree in indicating that a positive emotional climate is more important to the achievement gain of disadvantaged pupils than to middle class pupils. Further, there is strong agreement in current beliefs about best classroom practice on the desirability of a positive emotional climate.

The rating of proportion of activities which are assigned by the teacher in contrast to those in which the pupil has choice is based on work (Soar and Soar, 1972, 1973) showing a relationship between teacher directed activities and pupil achievement gain. This relationship was in the form of an inverted "U", in which either higher or lower amounts of teacher direction were associated with less pupil gain than intermediate amounts. This would suggest screening out teachers at either extreme, but we would recommend eliminating only those who assign or direct little of the pupil's activities, on the assumption that their pupils may have relatively little exposure to learning tasks. The finding that higher amounts of teacher direction were associated with decreased learning may have been caused by the failure of the teacher to assign tasks that appropriately met the pupil's need for learning, while a degree of choice permitted the pupil to fit the task to his needs. This difficulty might be remedied by a well-implemented individualized program.

The ratings which identify amount of pupil socialization and the extent to which pupils work alone have empirical bases which are only suggestive but they reflect current beliefs about educational settings which are conducive to pupil social development. Low inference measures of both of these exist.

The rating of interest and involvement of pupils is based on data indicating that interest is related with gain in achievement, and with other process variables, such as the emotional climate of the classroom, which are valued in themselves (Soar and Soar, 1973; Brophy and Evertson, 1974).

Cut-Off Points

If cut-off points are needed we would suggest eliminating classes rated as "almost none" for ratings on items 3, 4, 6 and 7; those rated "about 1/2" or more for item 2; those rated "almost all" for item 5; those rated "9 or more for item 8; "3/4 or more" for item 1; and "about 1/4" or less for item 9.

TEACHER'S QUESTIONNAIRE (Screening) (TQ-S)

Teacher's Name ______________________________

School ______________________ Grade Level ______

District ______________________ Ungraded Ages ______

State ______________________________

Content Area (Math or Reading) ______________________

We are interested in determining some of the ways in which you attend to various instructional tasks that we believe are common to most instructional contexts. First we will ask some general questions about curriculum for Math/Reading. For each instructional task, we would like to know the size of the group affected by some of your instructional decisions.

1. First with regard to curriculum scope. Would you say that your students would work in graded curriculum, that is:

   _____ a. Appropriate for the grade level only.

   _____ b. Appropriate for two or more grades, but less than the entire 1-6 curriculum.

   _____ c. Equivalent to an entire 1-6 grade curriculum.

2. Would you say that what you intend to teach this year will be based on expectancies for:

   _____ a. The grade group

   _____ b. Your class group as a whole.

   _____ c. Subgroups of your class.

   _____ d. Each learner independently.

3. For your class, will the sequence of learning tasks, most of the time, be:

____ a. Essentially the same as for other class groups of the same grade level in the school.

____ b. Essentially the same for your entire class.

____ c. Different for subgroups of your class.

____ d. Different for individuals.

4. Was your decision about where students were to start in the curriculum:

____ a. Essentially the same for your class as for other classes in the same grade in the school.

____ b. The same for all members of your class.

____ c. Different for different subgroups of your class.

____ d. Different for each individual.

5. When you decide what to teach next during the year, will the decision, most often, be made:

____ a. For your class as a whole.

____ b. For different subgroups in your class.

____ c. For each individual independently.

6. In evaluating learning would you say your decision most of the time, depends on the performance of:

____ a. The typical grade level group.

____ b. Your class group as a whole.

____ c. A subgroup of your class.

____ d. Each child individually.

7. In your classroom when you are evaluating learning by administering a test, would it be true most of the time that:

_____ a. Each learner would be taking a different test.

_____ b. A few groups smaller than the class would be taking different tests.

_____ c. The whole class would be taking the same test.

8. Would you say that the time you can make available for the pupil in any given instructional segment is dependent upon:

_____ a. Grade content to be covered.

_____ b. The time the majority or substantial portion of the class needs to learn the lesson.

_____ c. The time the majority of a class subgroup needs to learn the lesson.

_____ d. The time each individual needs to learn the lesson.

B. INSTRUMENTATION (continued)

2. Observation Forms

- Instructional Task Treatment Observation Form (ITTOF)
    - (a) Summary of the Pilot Test
    - (b) Suggested Training Program
- Florida Climate and Control System (FLACCS)
- Classroom Global Rating (GR)
- Teacher Practices Observation Record (TPOR)
- Classroom Description (CD)

INSTRUCTIONAL TASK TREATMENT
OBSERVATIONAL FORM (ITTOF)

(Trial Version - 10/17/75)

Name of Observer ______________________________

Date of Observation ____________________________

Observation/Class Number _______________________

Names of Other Observers _______________________

____

____

SUMMARY

1.0 _____

2.0 _____

3.0 _____

3.1 _____

3.2 _____

4.0 _____

5.0 _____

6.0 _____

7.0 _____

8.0 _____

8.1 _____

8.2 _____

9.0 _____

9.1 _____

9.2 _____

10.0 _____

10.1 _____

10.2 _____

1.0 PROVISION OF CURRICULUM OPPORTUNITY

Instructional Unit Size		Level of Attention	
The teacher provides a curriculum opportunity:		The teacher provides a curriculum opportunity for:	
equivalent to 3 or more grade levels	3	each individual in the class	3
equivalent to two grade levels	2	each subgroup in the class	2
equivalent to one grade level	1	the class group as a whole	1

Scope of: For:

Graded content	Individual Learners	Subgroups	Class Groups
Three or more grades	9	8	3
Two grades	7	6	2
One grade	5	4	1

2.0 STATEMENTS OF CURRICULUM INTENTIONS

Instructional Unit Size

The curriculum intentions are stated as:

pupil content behaviors	3
content offerings	2
broad goal statements	1

Level of Attention

The curriculum intentions are stated for:

individual learners	3
class subgroups	2
the class group as a whole	1

Specificity of Intentions	For: Individual Learners	Subgroups	Class Groups
Pupil Content Behaviors	9	8	3
Content Offerings	7	6	2
Broad Goal Statements	5	4	1

3.0 CURRICULUM PLACEMENT DECISION

Instructional Unit Size		Level of Attention	
The teacher makes the placement decision for:		The teacher makes the placement decision by:	
learners independently	3	criterion referenced performance	3
subgroups separately	2	judgment	2
for the class group as a whole	1	grade level expectations	1

Decision Based on:	For:		
	Individual Learners	Subgroups	Class Groups
Criterion-Referenced Performances	9	8	3
Judgment	7	6	2
Grade Level Expectations	5	4	1

4.0 ADJUSTING RATE OF INSTRUCTION

Instructional Unit Size

Teacher adjusts the rate of instruction for:

individuals	3
subgroups	2
class groups	1

	Individual Learners	Subgroups	Class Groups
4.0 Rate of Instruction	3	2	1

INSTRUCTIONAL EXPERIENCE

Frequency of Attention

High	Moderate	Low	
☐	☐	☐	5.0 Provision for Individual Responding
☐	☐	☐	6.0 Provision for Individual Feedback
☐	☐	☐	7.0 Monitoring Individual Progress

8.0 PERFORMANCE STANDARDS FOR ADVANCEMENT

Instructional Unit Size		Level of Attention	
8.1 The teacher applies standards for advancement to:		8.2 The teacher applies:	
individual learners	3	an absolute performance standard	3
subgroups of the class	2	a variable performance standard	2
the class group as a whole	1	no performance standard	1

Performance Standard Is	Applied to: Individual Learners	Subgroups	Class Groups
Absolute	9	8	3
Variable	7	6	2
Not Established	5	4	1

9.0 EVALUATION OF PERFORMANCE

Instructional Unit Size		Level of Attention	
9.1 The teacher evaluates performance in terms of:		9.2 The teacher evaluates performance in terms of:	
individual learners	3	program prepared test	3
subgroups as a whole	2	teacher prepared test	2
the class groups as a whole	1	judgment	1

Evaluation Based On	For: Individual Learners	Subgroups	Class Groups
Program Prepared Tests	9	8	3
Teacher Prepared Tests	7	6	2
Judgment	5	4	1

10.0 MATCHING LEARNERS WITH NEXT INSTRUCTION

Instructional Unit Size		Level of Attention	
10.1 The teacher matches learners with instruction for:		10.2 The teacher matches learners with instruction by:	
individuals separately	3	criterion-referenced performance	3
subgroups of the class	2	judgment	2
the class as a whole	1	position on standard curriculum sequence	1

Match with Instruction Based On:	For: Individual Learner	Subgroups	Class Groups
Criterion-Referenced Performances	9	8	3
Judgment	7	6	2
Position in Standard Curriculum Sequence	5	4	1

a. SUMMARY OF PILOT TEST OF THE INSTRUCTIONAL TASK TREATMENT OBSERVATION FORM (ITTOF)

Once it became clear during the planning of the study that it would be necessary to develop a new instrument to gather data regarding the program variables, plans were made to pilot test the Instructional Task Treatment Observation Form (ITTOF) in various classroom settings. It was recognized that, due to limited time and resources, a full and adequate pilot test of the ITTOF would not be possible. It was felt that such an effort would be useful in order to refine, as much as possible, the instrument itself, the suggested training program, and the recommended observation procedures. Because of the limited time available for training, it was decided to utilize highly experienced curriculum development experts who, by reason of their extensive experience and familiarity with developing, testing and monitoring of individualized programs, would require a minimum of training time. It was also reasoned that this type of observer, while far more experienced than might be required for the actual study, would more likely be able to make positive contributions to the improvement of the instrument, the procedures, and the training program.

The objectives of the initial pilot test of the ITTOF were as follows:

(1) Demonstrate that moderately-high inference observations of program variables could be made in a variety of classroom settings,

(2) Obtain a critical review of the procedures for administering the ITTOF,

(3) Obtain input for the improvement of the training program for the ITTOF,

(4) Obtain a measure of inter-rater agreement for the ITTOF, and

(5) Obtain some preliminary generalizability data.

Six experienced curriculum development staff were selected by the study designers on the basis of their classroom experience with the development and testing of individualized instruction in the basic skills. An initial training session of three hours was held to provide the necessary background for the study and the ITTOF.

During the initial training session, the primary investigators explained the instrument and its rationale and defined terms. Following the general introduction to the ITTOF, there was extensive interaction with the observation team and the instrument designers. The bulk of the session was recorded for use in restructuring the training program at a later date.

Following the primary training session a first round of observations was conducted in an IGE setting known to be well-implemented. Each observation session consisted of having three observers operate independently in the same classroom during the same lesson. Following the lesson, each observer would speak privately with the teacher to complete the observation. During the afternoon following these visitations a second training or debriefing session was held in which observers and the ITTOF designers were able again to interact extensively. A second and a third session of this type was held following successive observations in a variety of math and reading settings. What resulted from these sessions contributed substantially to the sharpening of definitions and improvement of operational procedures. As these experiences continued, there was a noticeable increase in inter-rater agreement for the same classroom period.

For those sets of observers who (1) made at least one prior observation using the ITTOF, and (2) attended a debriefing session following such observations, the inter-rater agreement ranged from a low of 64% to a high of 100%. And, these agreement percentages were for IPI (93%, 100%), IGE (79%), and standardized (64%, 93%) classes in both math and reading. In one instance inter-rater agreement was only 22% and it was determined that the problem arose because of a severe disparity between what the observers thought they observed (50% agreement) and what the teacher said was going on during the class session. Observers in this case, tended to resolve the disparity in different ways. While this remains as a possible problem, we are confident it is resolvable by preparing a pool of questions that might be asked of the teacher.

All but one of the twelve classes observed during the pilot test were fourth grade reading or mathematics. The exception was a combined multi-age group for grades 5 and 6. During the class period, observers operating independently, watched lessons, examined materials, studied student work in progress spoke with students, and observed teacher-pupil, pupil-aide, and pupil-pupil interactions. During this period, observers made notes regarding the program variables. Following the class period the teacher in charge answered questions raised by the observers. Since the questioning of the teacher does not follow a specific interview schedule, but rather is based upon the observer's perceptions made during the class period, these interviews were done independently. The interviews lasted approximately ten minutes each thus requiring about 30 minutes of the teacher's time away from the class. For this reason, in most cases, it was necessary to arrange for classroom coverage in order to have adequate time with the teacher. In some instances, it was necessary to arrange for payment of the teacher for the observation/interview process, particularly where arrangement for coverage was a problem.

The ITTOF form was filled out by each observer independently following the completion of the observation and the teacher interview. The names of the observers and the classes observed were identified by a numeric code to insure the confidential nature and objectivity of the data.

The specific recommendations of the observation team for the pilot test were:

(1) The training program should enable observers to obtain some preliminary experiences in a variety of instructional settings and a debriefing session following each such observation is recommended to achieve agreement on subsequent observations.

(2) Prior to making observations a brief overview of the program would be helpful.

(3) Also prior to making observations, observers should be familiar with the materials, objectives, test materials, etc.

(4) A pool of possible questions to be used with when interviewing teachers should be helpful.

(5) A pool of possible questions to be used with students should be helpful.

(6) A clear set of definitions should be developed to help observers make judgments.

(7) Rules for arriving at a consensual agreement when observational and interview data are in conflict is needed.

(8) A set of mini case studies possibly with short video taped classroom sequences would be helpful to observers during training.

(9) Several video tapes of entire classroom sessions and teacher interviews should be prepared for training. These would use a "through the eyes of the observer" approach.

In summary, the pilot test of the ITTOF achieved all of the intended objectives. There is the clear indication that it will be possible to make these moderately high inference observations with a fairly high degree of inter-rater agreement. It appears that observers who were able to participate in several successive observations and debriefings were able to achieve a high level of agreement. (Unfortunately, because of scheduling problems and availability of personnel, it was not always possible for an observer to attend complete debriefing sessions prior to the next observation.) It is felt that this will not be a problem to the study contractor since there should not be conflicting requirements on observation personnel during the study.

It is recommended that during the Spring of 1976, the contractor undertake a more intensive field testing of the ITTOF for two purposes. Firstly, to train the personnel who will be training the actual study observers and, secondly, to establish acceptable generalizability and inter-rater agreement figures. Such an effort should be undertaken by a group of curriculum development experts having extensive classroom observation experience.

b. SUGGESTED TRAINING PROGRAM FOR THE ITTOF

The training program for the use of the ITTOF should be developed by the contractor during the Spring of 1976. The development should be done by the same team of experienced curriculum development personnel who will participate as classroom observers in the field test of the ITTOFF during the early Spring.

The training of observers will involve three major phases. The first or introductory stage will introduce observers to the specifics of individualized instruction as it has been defined for the study. Since it is recommended that the observers have prior experience as classroom teachers, the instruction will contrast various forms of individualized instruction with standardized instruction. Where possible, teacher training films will be used to provide a commonality of experience among the observers. The introduction to individualized instruction will involve work in the training programs for the major individualized programs, IPI, PLAN* and IGE. Representatives of these programs will make presentations to the observer group and again training films will be used. At the conclusion of this first phase of training, each observer will have a working knowledge of the major individualized programs and will be able to contrast these with standardized programs in terms of the ten major program variables.

The second phase of the training will involve the introduction to various classroom observation techniques, followed by specific work on the use of the ITTOF. Training will be done with a series of video tapes of actual classroom situations. These tapes will be prepared during the Spring of 1976 using the "through the eyes of the observer" technique which will focus on those things an observer would be expected to focus on during a class observation. Tapes will also include interviews with teachers. Observers will use the tapes to complete an ITTOF rating which will be discussed with the other observers and the instructor. During the training session video tapes will be viewed in order of increasing difficulty with the first tape showing clearly identifiable individualized or standardized behavior followed by tapes that show situations more difficult to judge. At the completion of phase 2, the observers should finally understand the ITTOF and be able to attain high inter-rater agreement from video taped classes.

The final phase of training will occur during the last two weeks in September and the first week in October of 1976 when observers will be broken into teams of six and will observe classes in much the same manner as was used during the initial pilot test during the planning contract period. Each class observation and teacher interviews will be done by the observers and will be followed by a debriefing. The observations will not occur in study classes since during this same interval pretesting will be occurring in those classes. The purpose of this final training stage will be to give observers actual classroom experience in the use of the ITTOF and to demonstrate high agreement among observer ratings.

INSTITUTE FOR THE DEVELOPMENT OF HUMAN RESOURCES
University of Florida
Gainesville, Florida

FLACCS*

Florida Climate and Control System

Program ______________________ Teacher ______________________

City ______________________ Date ______________________

School ______________________ Observer ______________________

Grade ______________________ Series ______________________

Children's Art Work Displayed

Abundant & varied	Quite a few	Some	A few	None
5	4	3	2	1

Relation of Room Displays and Artifacts To Children's Subcultural Background

Most are clearly related	Quite a few are related	Some are related	A few are related	None are related	Not applicable
5	4	3	2	1	0

*This is an experimental form which should not be cited or used without permission of the developers.

Florida Climate and Control System - Cont.

C 1-3 Deck Number
C 4-7 T. Number
C 8 Grade
C 9 Reliability

NEGATIVE AFFECT

Series
Teacher

C.	Tot	1	2	3	Verbal	C.	Tot	1	2	3	Nonverbal
					Teacher						
10					Says "stop it," etc.	10					Waits for child
11					Uses threatening tone	11					Frowns
12					Rejects child	12					Points, shakes finger
13					Criticizes, blames	13					Pushes or pulls, holds
14					Warns	14					Shows disgust
15					Yells	15					Takes material
16					Scolds, humiliates	16					Refuses to respond to child
17					Other	17					Other
18					Code Involvement						
					Pupil						
19					Says "No," "I won't" etc.	18					Makes face, frowns
20					Teases	19					Pouts, withdraws
21					Laughs	20					Uncooperative, resistant
22					Tattles	21					Stamps, throws, slams
23					Commands or demands	22					Interferes, threatens
24					Makes disparaging	23					Takes, damages property
25					Demands attention	24					Picks at child
26					Makes someone "feel small	25					Pushes or pulls, holds
27					Finds fault	26					Hits, hurts
28					Threatens	27					Is left out
29					Other	28					Other
30					Code Involvement						

POSITIVE AFFECT

C.	Tot	1	2	3	Verbal	C.	Tot	1	2	3	Nonverbal
					Teacher						
31					Says "Thank you," etc.	29					Accepts favors for self
32					Agrees with child	30					Waits for child
33					Supports child	31					Gives individual attention
34					Gives individual attention	32					Warm, congenial
35					Warm, congenial	33					Listens carefully to child
36					Praises child	34					Smiles, laughs, nods
37					Develops "we feeling"	35					Pats, hugs, etc.
38					Is enthusiastic	36					Sympathetic
39					Other	37					Other
40					Code Involvement						
					Pupil						
41					Says "Thank you," etc.	38					Helpful, shares
42					Sounds friendly	39					Leans close to another
43					Agrees with another	40					Chooses another
44					Initiates contact	41					Smiles, laughs with another
45					Offers to share, cooperate	42					Pats, hugs another
46					Supports another	43					Agreeable, cooperative
47					Is enthusiastic	44					Enthusiastic
48					Praises another	45					Horseplay
49					Helps another	46					Other
50					Other	47					(Continued over)
51					Code Involvement						

CODE INVOLVEMENT

0. None involved
1. Few involved
2. Up to ½ the class
3. More than half

Pick up Column Number

C 1-3 Deck Number

C 4-7 T. Number

C 8 Grade
(2=Cont. 1st)

C 9 Reliability (0 or 1)

C.	Tot	1	2	3	TEACHER
10					Teacher Central
11					Leads singing, games, storytm
12					Moves freely among pupils
13					Withdraws from class
14					Uses blackboard, A-V Equip.
15					Ignores, refuses to attend P.
16					Attends P. briefly
17					Attends P. closely
18					Attends P. in succession
19					Attends simultaneous activ.
					VERBAL CONTROL
20					Praises
21					Asks for status
22					Suggests, guides
23					Feedback, cites reason
24					Questions for refltive. thot
25					Correct w/o criticism (CM)
26					Questions for control
27					Questions states Gen. rule
28					Directs with reason
29					Directs w/o reason
30					Uses time pressure
31					Call child by name (EWS)
32					Interrupts Pupil, cuts off
33					Warns
34					Supv. p. closely, imblizes.
35					Criticizes
36					Orders, commands
37					Scolds, punishes
38					Uses firm tone
39					Uses sharp tone
					NONVERBAL CONTROL
40					Tolerates deviant beh.
41					Positive redirection
42					Nods, smiles for control
43					Positive facial feedback
44					Uses "body English"
45					Gestures
46					Gives tangible reward
47					Touches, pats (gentle)
48					Holds, pushes, spanks (harsh)
49					Takes equipment, book
50					Signals, raps
51					Shhh! Shakes head
52					Glares, frowns

C.	Tot	1	2	3	PUPIL
10					Pupil Central
11					Pupil -- no choice
12					Pupil -- limited choice
13					Pupil -- free choice
14					(*Seat work w/o teacher
15					(*Seat work with teacher
16					(*Works, plays w. much supv.
17					(*Works, plays w. little supv.
18					(*Resists, disobeys directions
19					(*Obeys directions
20					Asks permission
21					Follows routine w/o reminder
22					Reports rule to another
23					Tattles
24					Gives information
25					Gives direction
26					Gives reason
27					Speaks aloud w/o permission
28					Engages in out-of-bounds beh.
29					Collaborates w. teacher
30					Task related movement
31					Aimless wandering
32					Fantasy
33					Uses play object as itself
34					Parallel play or work
35					Works, plays collaboratively
36					Works, plays competitively
37					Seeks reassurance, support
38					Shows pride
39					Shows fear, shame, humiliation
40					Shows apathy
					WORK GROUPS
41					Pupil as individual
42					Group w. teacher
43					Structured groups w/o t.
44					Free groups
					SOCIALIZATION
45					Almost never
46					Occasionally
47					Frequently
					MATERIALS
48					Structure T. behavior
49					Structure P. behavior
					PUPIL INTEREST ATTENTION
50-51					(Rank 1 low to 5 high)

Classroom Global Ratings

Pupil Groupings

Fixed and regular for activities	Mostly fixed	Emerge about half the time, fixed half the time	More often emerge spontaneously	Usually emerge spontaneously
1	2	3	4	5

Pupil Differentiation

Almost always work at same activity	Most work at same activity most of the time	Most work at same activity half of the time	Work at different activities more often than not	Usually work at different activities
1	2	3	4	5

Teacher Congruence

No feelings expressed	Words clearly contradict evident feelings		Some agreement of words and feelings		Words and feelings clearly agree
0	1	2	3	4	5

Teacher Empathy

Unaware of conspicuous feeling	Occasionally aware of obvious feeling	Usually aware of obvious feeling	Sometimes aware of subtle feeling	Often aware of subtle feeling
1	2	3	4	5

Freedom to Interact

Pupils are:	Rarely free		Occasionally free		Generally free
	1	2	3	4	5

Self-Control

Pupils:	Rarely show self-control		Occasionally show self-control		Generally show self-control
	1	2	3	4	5

Classroom Global Ratings - Cont.

Extent to which activities having clear cognitive focus characterize the classroom:

Rarely occur	About 1/4 of the time	About 1/2 of the time	About 3/4 of the time	Occur almost constantly
1	2	3	4	5

Overall Emotional-Attitudinal Climate

Highly positive	Positive most of the time	Neither positive nor negative	Negative Occasionally	Highly negative
5	4	3	2	1

TEACHER PRACTICES OBSERVATION RECORD

TOT	I	II	III	TEACHER PRACTICES A. NATURE OF THE SITUATION
				1. T occupies center of attention.
				2. T makes p center of attention.
				3. T makes some thing as a thing center of p's attention.
				4. T makes doing something center of p's attention.
				5. T has p spend time waiting, watching, listening.
				6. T has p participate actively.
				7. T remains aloof or detached from p's activities.
				8. T joins or participates in p's activities.
				9. T discourages or prevents p from expressing self freely.
				10. T encourages p to express self freely.
				B. NATURE OF THE PROBLEM
				11. T organizes learning around Q posed by T.
				12. T organizes learning around p's own problem or Q.
				13. T prevents situation which causes p doubt or perplexity.
				14. T involves p in uncertain or incomplete situation.
				15. T steers p away from "hard" Q or problem.
				16. T leads p to Q or problem which "stumps" him.
				17. T emphasizes idealized, reassuring, or "pretty" aspects of topic.
				18. T emphasizes realistic, disconcerting, or "ugly" aspects of topic.
				19. T asks Q that p can answer only if he studied the lesson.
				20. T asks Q that is not readily answerable by study of lesson.
				C. DEVELOPMENT OF IDEAS
				21. T accepts only one answer as being correct.
				22. T permits p to suggest additional or alternative answers.
				23. T expects p to come up with answer T has in mind.
				24. T asks p to judge comparative value of answers or suggestions.
				25. T expects p to "know" rather than to guess answer to Q.
				26. T encourages p to guess or hypothesize about the unknown or untested.
				27. T accepts only answers or suggestions closely related to topic.
				28. T entertains even "wild" or far-fetched suggestion of p.
				29. T lets p "get by" with opinionated or stereotyped answer.
				30. T asks p to support answer or opinion with evidence.

Teacher Practices Observation Record - Cont.

TOT	I	II	III	D. USE OF SUBJECT MATTER
				31. T collects and analyzes subject matter for p.
				32. T has p make his own collection and analysis of subject matter.
				33. T provides p with detailed facts and information.
				34. T has p find detailed facts and information on his own.
				35. T relies heavily on textbook as source of information.
				36. T makes a wide range of information material available
				37. T accepts and uses inaccurate information.
				38. T helps p discover and correct factual errors and inaccuracies.
				39. T permits formation of misconceptions and over-generalizations.
				40. T questions misconceptions, faulty logic, unwarranted conclusions.
				E. EVALUATION
				41. T passes judgment on p's behavior or work.
				42. T withholds judgment on p's behavior or work.
				43. T stops p from going ahead with plan which T knows will fail.
				44. T encourages p to put his ideas to a test.
				45. T immediately reinforces p's answer as "right" or "wrong."
				46. T has p decide when Q has been answered satisfactorily
				47. T asks another p to give answer if one p fails to answer quickly.
				48. T asks p to evaluate his own work.
				49. T provides answer to p who seems confused or puzzled.
				50. T gives p time to sit and think, mull things over.
				F. DIFFERENTIATION
				51. T has all p working at same task at same time.
				52. T has different p working at different tasks.
				53. T holds all p responsible for certain material to be learned.
				54. T has p work independently on what concerns p.
				55. T evaluates work of all p by a set standard.
				56. T evaluates work of different p by different standards.
				G. MOTIVATION, CONTROL
				57. T motivates p with privileges, prizes, grades.
				58. T motivates p with intrinsic value of ideas or activity.
				59. T approaches subject matter in direct, business-like way.
				60. T approaches subject matter in indirect, informal way.
				61. T imposes external disciplinary control on p.
				62. T encourages self-discipline on part of p.

Classroom Descriptions

Column			
1-3	____	Deck No.	
4-5	____	Program	
6-7	____	Teacher's Names	
8	____	Grade Level (0=K; 1=Ent. First; 2=Cont First; 3=2nd)	
9,10	____	Observer$_1$	01 Dr. Soar 05 Dee 09 Henry 13 Keith 17 Rose
11,12	____	Observer$_2$	02 Mrs. Soar 06 Eileen 10 Jeff 14 Marge 18 Wayne
			03 Barbie H. 07 Gene 11 John 15 Mary
			04 Barbara M. 08 Harriet 12 June 16 Pat
13,14	____	No. of Children Registered	
15	____	No. of Adults	
16	____	Largest pupil ethnic group present	1=Negro
17,18	____	Number	2=Anglo-6
19	____	Second largest pupil ethnic group present	3=Indian
20,21	____	Number	4=Spanish American
22	____	Third largest pupil ethnic group present	5=Other
23,24	____	Number	
25	____	Teacher ethnic group________________	
26	____	Major aide ethnic group________________	
27	____	Number	
28	____	Second aide ethnic group______________	
29	____	Number	
30	____	Sexes (1)____Male (2)____Female (3)_____Both	
		Physical Arrangement	
31	____	Rows __________(check)	1 if checked
32	____	Tables and rows______(check)	0 if not checked
33	____	Small group tables______(Check)	
34	____	Number of reading centers	
35	____	Number of interest centers	
36	____	Size of Community (will be filled in later)	
37,38	____	School Hours: Daily_________ to_________	
39,40	____	Meals & Snacks: Breakfast_____ to_____; Lunch______ to_______ AM Snack______ to_____; PM Snack_____ to____	
41,42	____	Structured Learning with Teacher (opening exercises, lessons, etc.)	
43,44	____	Structured Learning without Teacher (desk work, workbook, etc.)	
45,46	____	Unstructured Time (free play, recess, etc.)	
		Above 5 items have 2 columns; one decimal Example: 5 hrs 30 min=5.5; 40 minutes=0.7; 15 minutes=0.3	
47,48,49,50	____	Size of Classroom ________ ft. x ________ ft. (total square ft.)	
51	____	Carpet 0 = none 2 = large rug (1/3 area or more 1 = small rug 3 = wall to wall	
52	____	Soundproofing 0 = none; 1 = yes	
53	____	Number of years of previous school experience of the typical child in the class (include Headstart years)	
54	____	Number of years the teacher has had these same children in her class previously. (0=not before this year; 1=one year previous to this etc.)	
55	____	Other Grades in this Classroom (Use grade code w. Column 8)	

B. INSTRUMENTATION (continued)

3. Data Collection Forms

- Student Data Collection Form (SDCF)

STUDENT DATA COLLECTION FORM

1. Student's Name or Code ________________________________

2. School District ________________________________

3. School ________________________________

4. Date ____________________ 5. Grade ____________________

6. Date of Birth ______________ month ______________ year

7. Sex ☐ male ☐ female

8. Race ☐ Caucasian or White
   ☐ Negro or Black
   ☐ Spanish Surname
   ☐ Oriental
   ☐ American Indian
   ☐ Other (Specify) ____________________

9. Is English a foreign language for this student?
   ☐ Yes ☐ No

10. Level of education of head of household
    ☐ Graduate from college
    ☐ Attended college
    ☐ Graduate from high school
    ☐ Attended, but did not graduate from high school
    ☐ Finished 8th grade but did not attend high school
    ☐ Did not finish 8th grade

Student Data Collection Form (2)

11. Occupational category of head of household

☐ Professional (Doctor, Lawyer, etc.)
☐ Business owner or manager
☐ White collar worker (clerk, salesperson)
☐ Skilled worker: farm owner
☐ Unskilled, farm or service worker
☐ Unemployed

12. Estimated family annual income

☐ $15,000 and over
☐ Between $12,000 and 14,999
☐ Between $9,000 and 11,999
☐ Between $6,000 and 8,999
☐ Between $3,000 and 5,999
☐ Under $3,000

13. Standardized Test Measures

(a) Name of I. Q. Test

__________________________________ Score ________

(b) Name of Reading Achievement Test

__________________________________ Score ________ (pre)

(c) Name of Math Achievement Test ________ (post)

__________________________________ Score ________ (pre)

________ (post)

14. How many years experience has this child had in individualized instruction?

________ years

Student Data Collection Form (3)

15. How many days actually attended by this student?

_________ days

16. How many hours a day in reading/math?

_________ hours- Reading _________ hours- Math

17. Educational opportunity = #days x #hours instruc./day =

_________ hours

B. INSTRUMENTATION (continued)

4. Test Inventories and Questionnaires

- My Class Inventory (MCI)
- How I Feel About Reading/Math (HIFAR/M)
- Teacher Questionnaire (TQ)
- Survey of Individualized Reading and Math Programs

  School Principal Questionnaire (SPQ)
- Purdue Teacher Opinionaire (PTO)
- Selected NAEP Reading Items
  - (a) Summary Data
  - (b) Selected Items
- Selected NAEP Mathematics Items
  - (a) Selected Items
  - (b) Summary Data by Item
  - (c) Scoring Directions Where Applicable

These Sections
are
Interleaved

my class

NAME ______________________________

AGE ______________________________

MCI (2)

DIRECTIONS

This is not a test. The questions inside are to find out what your class is like. Please answer all the questions.

Each sentence is meant to describe your class. If you agree with the sentence circle yes. If you don't agree with the sentence, circle no.

Example

Circle
Your
Answer

1. Most children in the class are good friends. Yes No

If you think that most children in the class are good friends, circle the yes like this:

1. Most children in the class are good friends. [✓ Yes] No

If you do not think that most children in the class are good friends, circle the no like this:

1. Most children in the class are good friends. Yes [✓ No]

Now turn the page and answer all the questions about your class.

MCI (3)

	Circle Your Answer	
1. The pupils enjoy their schoolwork in my class.	Yes	No
2. Children are always fighting with each other.	Yes	No
3. The same people always do the best work in our class.	Yes	No
4. In our class the work is hard to do.	Yes	No
5. My best friends are in my class.	Yes	No
6. Some of the children in our class are mean.	Yes	No
7. Most pupils are pleased with the class.	Yes	No
8. Children often race to see who can finish first.	Yes	No
9. Many children in the class play together after school.	Yes	No
10. Most children can do their schoolwork without help.	Yes	No
11. Some pupils don't like the class.	Yes	No
12. Most children want their work to be better than their friend's work.	Yes	No
13. Many children in our class like to fight.	Yes	No
14. Only the smart people can do the work in our class.	Yes	No
15. In my class everybody is my friend.	Yes	No

Circle Your Answer

16. Most of the children in my class enjoy school. Yes No

17. Some pupils don't like other pupils. Yes No

18. Some pupils feel bad when they do not do as well as the others. Yes No

19. In my class I like to work with others. Yes No

20. In our class all the pupils know how to do their schoolwork. Yes No

21. Most children say the class is fun. Yes No

22. Some people in my class are not my friends. Yes No

23. Children have secrets with other children in the class. Yes No

24. Children often find their work hard. Yes No

25. Most children don't care who finishes first. Yes No

26. Some children don't like other children. Yes No

27. Some pupils are not happy in class. Yes No

28. All of the children know each other well. Yes No

29. Only the smart pupils can do their work. Yes No

30. Some pupils always try to do their work better than the others. Yes No

	Circle Your Answer	
31. Children seem to like the class.	Yes	No
32. Certain pupils always want to have their own way.	Yes	No
33. All pupils in my class are close friends.	Yes	No
34. Many pupils in our class say that school is easy.	Yes	No
35. In our class some pupils always want to do best.	Yes	No
36. Some of the pupils don't like the class.	Yes	No
37. Children in our class fight a lot.	Yes	No
38. All of the pupils in my class like one another.	Yes	No
39. Some pupils always do better than the rest of the class.	Yes	No
40. Schoolwork is hard to do.	Yes	No
41. Certain pupils don't like what other pupils do.	Yes	No
42. A few children in my class want to be first all of the time.	Yes	No
43. The class is fun.	Yes	No
44. Most of the pupils in my class know how to do their work.	Yes	No
45. Children in our class like each other as friends.	Yes	No

This instrument was developed at Harvard University by Gary J. Anderson and Herbert J. Walberg, May 1968. Revised, January 1969, by G.J.Anderson and Ronald E. Cayne, Faculty of Education, McGill University.

HOW I FEEL ABOUT READING/MATH

We would like you to answer the following questions so that you can tell us how you feel about Reading/Math. This is not a test and there are no right or wrong answers. Just answer as best you can. You can answer either "Yes", "?", or "No". Let's do one for practice!

I LIKE TO WATCH TELEVISION	YES	?	NO

If you like to watch television you would circle "Yes"; if you never like to watch television you would circle "No". If you don't know if you like to watch television, you would circle "?". Make sure you circle one of the choices. If your answer is "sometimes", you have to decide whether it is more yes or more no.

I will read every question to you as we go along. Mark your answers with a circle next to each question. If you are not sure what a question says then raise your hand and I will help you.

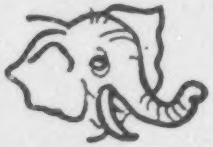
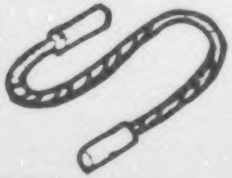
Make sure that you answer all of the questions. Do not skip any. When you are finished you should work quietly at your desk until everyone has finished.

HOW I FEEL ABOUT READING/MATH

1. I like to talk about Reading/Math at home.
2. I think Reading/Math class is boring.
3. I like to talk about what I find in Reading/Math lessons.
4. I like to Read Stories/Do Math Problems over again.
5. I like Reading/Math.
6. I like to help my classmates with Reading/Math problems.
7. I like to read Story/Math books.
8. I like school better on the days that I have Reading/Math class.
9. Reading/Math is not an important subject.
10. When the other students talk about Reading/Math I want to walk away.
11. I like to talk to teachers about Reading/Math.
12. I would like to teach Reading/Math if I were a teacher.
13. I would like to buy a Story Book (Reading Only).

    I would like to buy a Math Book (Math Only).
14. I wish that I didn't have to take Reading/Math.
15. Reading/Math is too much work.
16. I like to get Reading/Math books when I go to the library.
17. I can't wait for Reading/Math class to be over.
18. I like to Read/Do Math Problems at home.
19. Sometimes I Read/Do Math Problems at home just for fun.
20. I like to ask questions about Reading/Math.
21. I like to Read Stories/Do Math Problems.
22. I like to talk to my friends about Reading/Math.

How I Feel About Reading/Math Prototype Answer Sheet

	Student Text	Yes	?	No
	Student Text	Yes	?	No
	Student Text	Yes	?	No
	Student Text	Yes	?	No
	Student Text	Yes	?	No
	Student Text	Yes	?	No

HOW I FEEL ABOUT READING/MATH

DESCRIPTION AND SCORING OF THE QUESTIONNAIRE

Description:

This inventory consists of twenty-two statements derived from the "How I Feel About School and Science" questionnaires. The items have been altered slightly to give a measure of the student's general attitude towards reading or mathematics. As with the standard forms, the subject may answer "Yes", "?", or "No" depending on how he feels about each statement.

Scoring:

For those items which express a favorable attitude towards reading/math (Numbers 1, 3, 4, 5, 6, 7, 8, 11, 12, 13, 16, 18, 19, 20, 21, 22) Score:

One point for "Yes" answers;
Two points for "?" answers;
Three points for "No" answers.

For those items which express a negative attitude towards reading/math (Numbers 2, 9, 10, 14, 15, 17) reverse the scoring values. Thus:

Three points for "Yes" answers;
Two points for "?" answers;
One point for "No" answers.

Subject test scores are determined by adding the number of points given for each question.

TEACHER QUESTIONNAIRE
(TQ)

1. School District ______________________________

2. School ______________________________

3. Date ______________________________

4. Teacher's Name ______________________________

5. Program Type: ☐ Individualized ☐ Standardized

6. Race:
   - ☐ Caucasian or White
   - ☐ Negro or Black
   - ☐ Spanish Surname
   - ☐ Oriental
   - ☐ American Indian
   - ☐ Other (Specify) ______________________________

7. Sex: Male ☐ Female ☐

8. How many years of teaching experience, including the present year, have you had in teaching compensatory education learners?
   - ☐ One year or less
   - ☐ Two or three years
   - ☐ Four or five years
   - ☐ Six through nine years
   - ☐ Between 10 and 20 years
   - ☐ More than 20 years

9. How many pupils do you have in your class? __________ pupils

10. What is the name of the reading or math program with which you are working?

    ____

    ____

11. How many years have you been working with the above program?
    - ☐ This is my first year
    - ☐ This is my second year
    - ☐ This is my third year
    - ☐ Four or five years
    - ☐ More than five years

12. What was the nature of the special training or orientation you received in regard to implementing the above program? (Check all that apply)
    - ☐ I received no special training
    - ☐ After school or weekend workshop
    - ☐ Released-time workshop
    - ☐ Summer workshop or institute
    - ☐ Individual instruction with supervised teaching
    - ☐ College course
    - ☐ Other (Specify) ____________________

13. How adequately was your special training in preparing you to implement the above program?
    - ☐ Very adequate
    - ☐ Moderately adequate
    - ☐ Fairly adequate
    - ☐ Not at all adequate

Teacher Questionnaire (3)

14. Do you believe that the compensatory math or reading program you are working with is generally worthwhile?

- ☐ Definitely-- YES
- ☐ Probably-- YES
- ☐ I am undecided
- ☐ Probably-- NO
- ☐ Definitely-- NO

15. How much cooperative planning is there among principal and teacher in terms of program goals, improvement, problems?

- ☐ A great deal
- ☐ A moderate amount
- ☐ None at all

16. Would you strongly recommend the math or reading program, with which you are working, to other teachers?

Reading	Math	
☐	☐	Definitely--YES
☐	☐	Probably--YES
☐	☐	I am undecided
☐	☐	Probably-- NO
☐	☐	Definitely--NO
☐	☐	Question not applicable to me

17. If you had your choice regarding the curriculum for next year, would you choose to continue to use the same reading or math program?

Reading	Math	
☐	☐	Definitely--YES
☐	☐	Probably--YES
☐	☐	I am undecided
☐	☐	Probably--NO
☐	☐	Definitely--NO

☐	☐	Question not applicable to me

SURVEY OF INDIVIDUALIZED READING AND MATH PROGRAMS
SCHOOL PRINCIPAL QUESTIONNAIRE
(SPQ)

School Name ______________________________

School District ______________________________

Principal's Name ______________________________

Program Type (Individualized or Standardized) ______________

Directions: This questionnaire is intended to elicit information about your school and the students in your school. Information is also elicited regarding your school district's policy regarding individualization and the degree of support offered by parents and advisory groups.

Answer all questions with reference to the current school year unless otherwise indicated.

1. School enrollment this year (number of pupils).

   ☐ Less than 100
   ☐ 100-299
   ☐ 300-499
   ☐ 500-699
   ☐ 700-899
   ☐ 900 or more

2. Estimated percentage of students of the following racial or national origins. (Check only one box in each lettered row).

	0-10%	11-50%	51-90%	91-100%
(a) Caucasian or White				
(b) Negro or Black				
(c) Spanish surnamed				
(d) Oriental				
(e) American Indian				
(f) Other (Specify) ________				

School Principal Questionnaire (2)

3. Estimated percentage of pupils whose head of household attained the following levels of education. (Check only one box in each lettered row).

	0-10%	11-50%	51-90%	91-100%
(a) Attended college				
(b) Graduated from high school but did not attend college				
(c) Attended but did not graduate from high school				
(d) Finished 8th grade but did not attend high school				
(e) Did not finish 8th grade				

4. Estimated percentage of school families in each of the following occupational categories. (Check only one box in each lettered row).

	0-10%	11-50%	51-90%	91-100%
(a) Professionals (Doctors, Lawyers, etc.)				
(b) Business owners or managers				
(c) White collar workers (clerks, salespeople, etc.)				
(d) Skilled workers; farm owners				
(e) Unskilled, farm, or service workers				
(f) Unemployed				

School Principal Questionnaire (3)

5. Estimated percentage of school families that have each of the following annual incomes. (Check only one box in each lettered row).

	0-10%	11-50%	51-90%	91-100%
(a) $12,000 and over				
(b) Between $9,000 and 11,999				
(c) Between $6,000 and 8,999				
(d) Between $3,000 and 5,999				
(e) Under $3,000				

6. About what percentage of the families of students participating in math or reading instruction are represented as parent volunteers to assist in some way in school?

☐ 0-5%
☐ 6-10%
☐ 11-20%
☐ 21-40%
☐ 41-70%
☐ 71-100%

7. About what percentage of the families of students at your school are represented at a typical meeting of the PTA or similar parent group?

☐ 0-5%
☐ 6-10%
☐ 11-20%
☐ 21-40%
☐ 41-70%
☐ 71-100%

8. What percentage of new programs or curricula used in your school originate from the following sources?

	None	A few	Several	Many/Most
Teacher Curriculum Committee(s)	☐	☐	☐	☐
Community Pressures	☐	☐	☐	☐
Principal	☐	☐	☐	☐
District or Area Office	☐	☐	☐	☐
Curriculum Coordinator(s)	☐	☐	☐	☐

9. How long have you used this compensatory reading and/or math program(s) in your school? (Fill in names of programs)

	Program 1	Program 2	Program 1	Program 2
One school year or less				
More than 1 but less than 2				
More than 2 but less than 3				
Three or more years				

10. To what degree has your school district supported the implementation of your reading and/or math compensatory education program(s)?

	Not Supportive	Slightly Supportive	Moderately Supportive	Very Supportive
(a) Monies for non-professional support staff				
(b) Released-time for professional staff				
(c) Monies for additional professional staff				
(d) Monies for training workshops or institutes				
(e) Other (Specify) _______________ _______________				

11. What is the average turnover rate in your school on a yearly basis?

____

The Purdue Teacher Opinionaire

(Bentley, R. R. and Rempel, A. M. *The Purdue Teacher Questionnaire, Indiana, University Book Store, 1967.)*

Purpose and Use

The *Purdue Teacher Opinionaire* is designed to provide a measure of teacher morale. Not only does the *Opinionaire* yield a total score indicating the general level of a teacher's morale, but it also provides meaningful sub-scores which break down morale into some of its dimensions. The ten categories included are: (1) Teacher Rapport with Principal; (2) Satisfaction with Teaching; (3) Rapport Among Teachers; (4) Teacher Salary; (5) Teacher Load; (6) Curriculum Issues; (7) Teacher Status; (8) Community Support of Education; (9) School Facilities and Services; and (10) Community Pressures.

The instrument can be useful to school administrators, school staffs, and researchers who desire an objective and practical index of teacher morale in particular schools or school systems. Comparisons can be made among teachers when grouped by schools, grade levels, subject areas, tenure status, etc. The *Opinionaire* provides specific and valid information about crucial problems and tensions which concern the faculty and have an adverse effect on their morale. Very basic to improving the level of morale is an adequate understanding and diagnosis of how teachers feel about their particular school situation.

Directions for Administration

The directions for completing the *Purdue Teacher Opinionaire* are given on the cover page of the *Opinionaire* and are self-explanatory. No time limit is imposed; however, most teachers will complete the instrument in 20 to 30 minutes. In order to obtain valid and reliable data, all responses to the instrument should remain strictly confidential.

THE PURDUE TEACHER OPINIONAIRE

Prepared by Ralph R. Bentley and Averno M. Rempel

This instrument is designed to provide you the opportunity to express your opinions about your work as a teacher and various school problems in your particular school situation. There are no right or wrong responses, so do not hesitate to mark the statements frankly.

Fill in the information below. You will notice that there is no place for your name. Please **do not** record your name. All responses will be strictly confidential and results will be reported by groups only. DO NOT OMIT ANY ITEMS.

School____________________________ Date______________________
month day year

Age________ Sex________ Highest Degree Completed__________________

DIRECTIONS FOR RECORDING RESPONSES ON OPINIONAIRE

Read each statement carefully. Then indicate whether you agree, probably agree, probably disagree, or disagree with each statement. Mark your answers in the following manner:

If you agree with the statement, circle "A" .... [✓ A] PA PD D

If you are somewhat uncertain, but probably agree with the statement, circle "PA" .... A [✓ PA] PD D

If you are somewhat uncertain, but probably disagree with the statement, circle "PD" .... A PA [✓ PD] D

If you disagree with the statement, circle "D" .... A PA PD [✓ D]

Copyright 1967, Purdue Research Foundation

1. Details, "red tape," and required reports absorb too much of my time.......... A PA PD D

2. The work of individual faculty members is appreciated and commended by our principal.......... A PA PD D

3. Teachers feel free to criticize administrative policy at faculty meetings called by our principal.......... A PA PD D

4. The faculty feels that their suggestions pertaining to salaries are adequately transmitted by the administration to the board of education.......... A PA PD D

5. Our principal shows favoritism in his relations with the teachers in our school.......... A PA PD D

6. Teachers in this school are expected to do an unreasonable amount of record-keeping and clerical work.......... A PA PD D

7. My principal makes a real effort to maintain close contact with the faculty.......... A PA PD D

8. Community demands upon the teacher's time are unreasonable.......... A PA PD D

9. I am satisfied with the policies under which pay raises are granted.......... A PA PD D

10. My teaching load is greater than that of most of the other teachers in our school.......... A PA PD D

11. The extra-curricular load of the teachers in our school is unreasonable.......... A PA PD D

12. Our principal's leadership in faculty meetings challenges and stimulates our professional growth.......... A PA PD D

13. My teaching position gives me the social status in the community that I desire.......... A PA PD D

14. The number of hours a teacher must work is unreasonable.......... A PA PD D

15. Teaching enables me to enjoy many of the material and cultural things I like.......... A PA PD D

16. My school provides me with adequate classroom supplies and equipment.......... A PA PD D

17. Our school has a well-balanced curriculum.......... A PA PD D

18. There is a great deal of griping, arguing, taking sides, and feuding among our teachers.......... A PA PD D

19. Teaching gives me a great deal of personal satisfaction.......... A PA PD D

20. The curriculum of our school makes reasonable provision for student individual differences.......... A PA PD D

21. The procedures for obtaining materials and services are well defined and efficient.......... A PA PD D

22. Generally, teachers in our school do not take advantage of one another.......... A PA PD D

23. The teachers in our school cooperate with each other to achieve common, personal, and professional objectives.......... A PA PD D

Continue with item 24 on next page

24. Teaching enables me to make my greatest contribution to society.......A PA PD D

25. The curriculum of our school is in need of major revisions.......A PA PD D

26. I love to teach.......A PA PD D

27. If I could plan my career again, I would choose teaching.......A PA PD D

28. Experienced faculty members accept new and younger members as colleagues.......A PA PD D

29. I would recommend teaching as an occupation to students of high scholastic ability....A PA PD D

30. If I could earn as much money in another occupation, I would stop teaching.......A PA PD D

31. The school schedule places my classes at a disadvantage.......A PA PD D

32. Within the limits of financial resources, the school tries to follow a generous policy regarding fringe benefits, professional travel, professional study, etc.......A PA PD D

33. My principal makes my work easier and more pleasant.......A PA PD D

34. Keeping up professionally is too much of a burden.......A PA PD D

35. Our community makes its teachers feel as though they are a real part of the community.......A PA PD D

36. Salary policies are administered with fairness and justice.......A PA PD D

37. Teaching affords me the security I want in an occupation.......A PA PD D

38. My school principal understands and recognizes good teaching procedures.......A PA PD D

39. Teachers clearly understand the policies governing salary increases.......A PA PD D

40. My classes are used as a "dumping ground" for problem students.......A PA PD D

41. The lines and methods of communication between teachers and the principal in our school are well developed and maintained.......A PA PD D

42. My teaching load in this school is unreasonable.......A PA PD D

43. My principal shows a real interest in my department.......A PA PD D

44. Our principal promotes a sense of belonging among the teachers in our school.......A PA PD D

45. My heavy teaching load unduly restricts my nonprofessional activities.......A PA PD D

46. I find my contacts with students, for the most part, highly satisfying and rewarding....A PA PD D

47. I feel that I am an important part of this school system.......A PA PD D

48. The competency of the teachers in our school compares favorably with that of teachers in other schools with which I am familiar.......A PA PD D

Continue with item 49 on next page

49. My school provides the teachers with adequate audio-visual aids and projection equipment A PA PD D

50. I feel successful and competent in my present position A PA PD D

51. I enjoy working with student organizations, clubs, and societies A PA PD D

52. Our teaching staff is congenial to work with A PA PD D

53. My teaching associates are well prepared for their jobs A PA PD D

54. Our school faculty has a tendency to form into cliques A PA PD D

55. The teachers in our school work well together A PA PD D

56. I am at a disadvantage professionally because other teachers are better prepared to teach than I am A PA PD D

57. Our school provides adequate clerical services for the teachers A PA PD D

58. As far as I know, the other teachers think I am a good teacher A PA PD D

59. Library facilities and resources are adequate for the grade or subject area which I teach A PA PD D

60. The "stress and strain" resulting from teaching makes teaching undesirable for me A PA PD D

61. My principal is concerned with the problems of the faculty and handles these problems sympathetically A PA PD D

62. I do not hesitate to discuss any school problem with my principal A PA PD D

63. Teaching gives me the prestige I desire A PA PD D

64. My teaching job enables me to provide a satisfactory standard of living for my family A PA PD D

65. The salary schedule in our school adequately recognizes teacher competency A PA PD D

66. Most of the people in this community understand and appreciate good education A PA PD D

67. In my judgment, this community is a good place to raise a family A PA PD D

68. This community respects its teachers and treats them like professional persons A PA PD D

69. My principal acts as though he is interested in me and my problems A PA PD D

70. My school principal supervises rather than "snoopervises" the teachers in our school A PA PD D

71. It is difficult for teachers to gain acceptance by the people in this community A PA PD D

72. Teachers' meetings as now conducted by our principal waste the time and energy of the staff A PA PD D

Continue with item 73 on next page

73. My principal has a reasonable understanding of the problems connected with my teaching assignment A PA PD D

74. I feel that my work is judged fairly by my principal A PA PD D

75. Salaries paid in this school system compare favorably with salaries in other systems with which I am familiar A PA PD D

76. Most of the actions of students irritate me A PA PD D

77. The cooperativeness of teachers in our school helps make my work more enjoyable A PA PD D

78. My students regard me with respect and seem to have confidence in my professional ability A PA PD D

79. The purposes and objectives of the school cannot be achieved by the present curriculum A PA PD D

80. The teachers in our school have a desirable influence on the values and attitudes of their students A PA PD D

81. This community expects its teachers to meet unreasonable personal standards A PA PD D

82. My students appreciate the help I give them with their school work A PA PD D

83. To me there is no more challenging work than teaching A PA PD D

84. Other teachers in our school are appreciative of my work A PA PD D

85. As a teacher in this community, my nonprofessional activities outside of school are unduly restricted A PA PD D

86. As a teacher, I think I am as competent as most other teachers A PA PD D

87. The teachers with whom I work have high professional ethics A PA PD D

88. Our school curriculum does a good job of preparing students to become enlightened and competent citizens A PA PD D

89. I really enjoy working with my students A PA PD D

90. The teachers in our school show a great deal of initiative and creativity in their teaching assignments A PA PD D

91. Teachers in our community feel free to discuss controversial issues in their classes A PA PD D

92. My principal tries to make me feel comfortable when he visits my classes A PA PD D

93. My principal makes effective use of the individual teacher's capacity and talent A PA PD D

94. The people in this community, generally, have a sincere and wholehearted interest in the school system A PA PD D

Continue with item 95 on next page

95. Teachers feel free to go to the principal about problems of personal and group welfare .... A PA PD D

96. This community supports ethical procedures regarding the appointment and reappointment of members of the teaching staff .... A PA PD D

97. This community is willing to support a good program of education .... A PA PD D

98. Our community expects the teachers to participate in too many social activities .... A PA PD D

99. Community pressures prevent me from doing my best as a teacher .... A PA PD D

100. I am well satisfied with my present teaching position .... A PA PD D

THE PURDUE TEACHER OPINIONAIRE SCORING KEY

Page 2

Item No.	Keyed Response	Factor No.
1.	D	5
2.	A	1
3.	A	1
4.	A	4
5.	D	1
6.	D	5
7.	A	1
8.	D	5
9.	A	4
10.	D	5
11.	D	5
12.	A	1
13.	A	7
14.	D	5
15.	A	7
16.	A	9
17.	A	6
18.	D	3
19.	A	2
20.	A	6
21.	A	9
22.	A	3
23.	A	3

Page 3

Item No.	Keyed Response	Factor No.
24.	A	2
25.	D	6
26.	A	2
27.	A	2
28.	A	3
29.	A	2
30.	D	2
31.	D	5
32.	A	4
33.	A	1
34.	D	5
35.	A	7
36.	A	4
37.	A	7
38.	A	1
39.	A	4
40.	D	5
41.	A	1
42.	D	5
43.	A	1
44.	A	1
45.	D	5
46.	A	2
47.	A	2
48.	A	3

Page 4

Item No.	Keyed Response	Factor No.
49.	A	9
50.	A	2
51.	A	2
52.	A	3
53.	A	3
54.	D	3
55.	A	3
56.	D	2
57.	A	9
58.	A	2
59.	A	9
60.	D	2
61.	A	1
62.	A	1
63.	A	7
64.	A	7
65.	A	4
66.	A	8
67.	A	8
68.	A	7
69.	A	1
70.	A	1
71.	D	7
72.	D	1

Page 5

Item No.	Keyed Response	Factor No.
73.	A	1
74.	A	1
75.	A	4
76.	D	2
77.	A	3
78.	[illegible]	2
79.	D	6
80.	A	3
81.	D	10
82.	A	2
83.	A	2
84.	A	3
85.	D	10
86.	A	2
87.	A	3
88.	A	6
89.	A	2
90.	A	3
91.	A	10
92.	A	1
93.	A	1
94.	A	8

Page 6

Item No.	Keyed Response	Factor No.
95.	A	1
96.	A	8
97.	A	8
98.	D	10
99.	D	10
100.	A	2

SCORING DIRECTIONS: PURDUE TEACHER OPINIONAIRE

1. Tear yellow Scoring Key into five (5) strips, one for each page of the test.

2. Line up appropriate strip to the left of the answer columns.

3. On each page, score the "Red D" items first. On page 2, for example, these are items: 1, 5, 6, 8, 10, 11, 14 and 18.

"Red D" items are scored as follows:

Ⓐ = 1
(PA) = 2
(PD) = 3
Ⓓ = 4

4. Write down the appropriate item score for each item to the right of the answer column. Do not record anything other than a 1, 2, 3 or 4. If none of the answers has been circled, put a dash (--) next to the item.

5. After scording the "Red D" , score the "Black A" ones.

"Black A" items are scored as follows:

Ⓐ = 4
(PA) = 3
(PD) = 2
Ⓓ = 1

6. Again, write down the appropriate item score for each item to the right of the answer column. Do not record anything other than a 1, 2, 3 or 4. If none of the answers has been circled, put a dash (--) next to the item.

PURDUE TEACHER OPINIONAIRE: DIRECTIONS FOR CODING

1. Use one transfer form for every six teachers in a given school.

2. Each teacher will take two lines (cards). The Header information (Columns 1 - 14) is repeated on both lines. Line 1 will cover Items 1 - 60; Line 2 will cover Items 61 - 100.

3. Columns 1 - 5: School Code. This is the five (5) digit number written in pencil under the words, "Prepared by Ralph R. Bentley...." on each test.

4. Columns 6 - 7: Teacher Number. This is the one (1) or two (2) digit number written after the School Code Number. Any number between 1 and 9 must be coded with a "0" first; i.e. 01, 02, 07.

5. Column 8: Card Number. Each teacher will have two cards. Write in "1" for th for the first card (on the first line per teacher) and "2" for the second card (on the second line per teacher).

6. Columns 9 - 10: Age. Copy the actual age given on the Opinionaire. If it has been omitted, code a "00" in the two columns.

7. Column 11: Sex. Code a "1" for Female and a "2" for Male. If this information has been omitted, code a "0" in this column.

8. Columns 12 - 13: Years Teaching. This is the first of the two numbers written in below the words, "Highest Degree Completed", on each test. Copy the number as it is, remembering to put a "0" before any one-place digit; i.e. 01, 05, 09.

9. Column 14: Years Teaching IPI. This is the one (1) digit number written in after the number for Years Teaching. Copy as is. Most Control School teachers will have a "0".

10. Columns 15 - 20. Leave BLANK.

11. Columns 21 - 80, Line 1. Record scores for Items 1 - 60. These are all one-digit, and can be only a 1, 2, 3 or 4.

12. Columns 21 - 60, Line 2. Record scores for Items 61 - 100.

13. Any items for which no answer has been circled and are, therefore, unscored, should be "coded" with a dash (—).

SELECTED NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS (NAEP)

Reading Items

We have selected released NAEP items for which no copyright release is requested. Items were selected such that the national percentage of nine year olds responding correctly was ≥ 85% and the percentage of inner city (low metro) pupils was ≥ 40%. Items from each of five themes were selected. Item numbers, national and low metro percentages, mode of administering and time of administering for the items selected are shown below for each theme. Total testing time is 25 minutes.

A Summary Data for Selected Reading Items

Theme 1: Understanding words and word relationships

Item #	National %	Inner city	Mode of Admin.	Time of Admin.
R10101	95.2	88.7	1) Directions-tape recorded 2) Stem read by respondent 3) Response-written by respondent	3/4 min.
R10403	91.6	81.8	1) Directions tape recorded 2) Stem read by respondent 3) Response-written by respondent	1 min.
R10601	85.3	63.0	"	1 1/2 min.
R10901	88.1	73.8	"	1 1/4 min.
R12101	92.6	79.8	"	1 min.
				5.5 min.

Summary Data - NAEP Reading Items (continued)

Theme 2: Graphic Materials

Item #	National %	Inner City %	Mode of Admin.	Time of Admin.
R20301	8.75	68.0	1) Directions tape recorded	1 1/4 min.
R20601	88.8	80.2	"	1 min.
R20801	87.3	81.0	"	1 min.
R21001	85.3	68.3	"	1 1/2 min.
R21201	97.0	94.1	"	3/4 min.
R21403	85.4	68.5	"	3 min.
				8.5 min.

Theme 3: Written Directions

Item #	National %	Inner city %	Mode of Admin.	Time of Admin.
R30302	93.3	83.8	1) Directions-tape recorded 2) Stem-read by respondent 3) Response-written by respondent	3 min.

Theme 4: Reference Material

Item #	National %	Inner city %	Mode of Admin.	Time of Admin.
R41203	91.3	81.2	1) Directions-read by interviewer 2) Stem-read by Interviewer 3) Response-oral by respondent written by interviewer	6 min.
R41205	92.9	87.7	"	6 min.

Summary Data - NAEP Reading Items (continued)

Theme 5: Gleaning Significant Facts from Passages

Item #	National %	Inner city %	Mode of Admin.	Time of Admin.
R52001	85.7	74.0	1) Directions-tape recorded 2) Stem-read by respondent 3) Response-written by respondent	1 min.

Theme 6: Drawing Inferences

Item #	National %	Inner city %	Mode of Admin.	Time of Admin.
R71401	86.0	65.7	1) Directions-tape recorded 2) Stem-read by respondent 3) Response-written by respondent	1 min.

Selected NAEP Reading Items

AGE LEVEL: 9

RELEASE NO: 101

PACKAGE-EXERCISE NO: 1-11

OBJECTIVE: I A2b

THEME: 1. Understanding Word Meanings
A. In Isolation

IDENTICAL OR SIMILAR PASSAGES: Age 9: 9-5

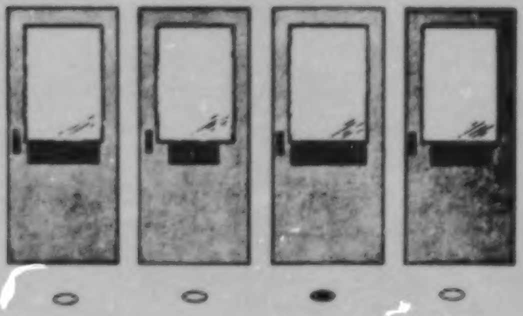
MODE OF ADMINISTRATION: Group
Directions - Tape recorded
Stem - Read by respondent
Response - Written by respondent

TIME OF ADMINISTRATION: 3/4 minute

COPYRIGHT REQUIREMENT: No

Here are pictures of four doors you might find in a school.

Fill in the oval under the door where you might go for lunch.



○ I don't know.

AGE LEVEL: 9 13

RELEASE NO:
A. 10401 10401
B. 10402 10402
b. 10403* 10403*

PACKAGE-EXERCISE NOS: 2-16 7-16

OBJECTIVE: III B2

THEME: 1. Understanding Word Meanings
B. In Context

IDENTICAL OR SIMILAR PASSAGES: None

MODE OF ADMINISTRATION: Group
Directions - Tape recorded
Stem - Read by respondent
Response - Written by respondent

TIME OF ADMINISTRATION: Age 9: 1 minute
Age 13: 3/4 minute

COPYRIGHT REQUIREMENT: No

*Special derived value:

00 = No response
10* = Never been to the Moon
20 = Ever been to the Moon (incorrect)
21 = Ever and Never been to the Moon (incorrect)

Read the sentences and do what they tell you to do.

○ If you have EVER visited the Moon, fill in the oval here.

● If you have NEVER visited the Moon, fill in the oval here.

Selected NAEP Reading Items

AGE LEVEL:	9 13
RELEASE NO:	106 106
PACKAGE-EXERCISE NOS:	3-16 4-5
OBJECTIVE:	I B
THEME:	1. Understanding Word Meanings B. In Context
IDENTICAL OR SIMILAR PASSAGES:	None
MODE OF ADMINISTRATION:	Group Directions - Tape recorded Stem - Read by respondent Response - Written by respondent
TIME OF ADMINISTRATION:	Age 9: 1 1/2 minutes Age 13: 3/4 minute
COPYRIGHT REQUIREMENT:	No

People who run zoos sometimes put signs on animal cages to tell what the animals are like or where they come from. If you went to a zoo and saw these four signs on different cages, which one would tell you that there is a dangerous animal inside the cage? Fill in the oval beside the correct sign.

○ Inside this cage is one of the smallest animals found in America.

● Inside this cage is an extremely ferocious animal.

○ Inside this cage is an animal that sleeps all the time.

○ Inside this cage is a rare type of eagle-- one of the few left in the world.

○ I don't know.

AGE LEVEL:	9
RELEASE NO:	109
PACKAGE-EXERCISE NO:	5-2
OBJECTIVE:	I B1b
THEME:	1. Understanding Word Meanings B. In Context
IDENTICAL OR SIMILAR PASSAGES:	None
MODE OF ADMINISTRATION:	Group Directions - Tape recorded Stem - Read by respondent Response - Written by respondent
TIME OF ADMINISTRATION:	1 1/4 minutes
COPYRIGHT REQUIREMENT:	No

Complete the sentence with the words that make the MOST sense.

The boy wanted

● a new ball.
○ under dinner.
○ rode his bike.
○ to the circus.
○ stopped raining.

○ I don't know.

Selected NAEP Reading Items

AGE LEVEL:	9	13
RELEASE NO:	121	131
PACKAGE-EXERCISE NOS:	3-18	12-9
OBJECTIVE:	I A1f	
THEME:	3. Following Written Directions B. Carrying out Written Directions	
IDENTICAL OR SIMILAR PASSAGES:	None	
MODE OF ADMINISTRATION:	Group Directions - Tape recorded Stem - Read by respondent Response - Written by respondent	
TIME OF ADMINISTRATION:	Age 9: 1 minute Age 13: 1 minute	
COPYRIGHT REQUIREMENT:	No	

A compound word is a word which is made by joining two words together. Fill in the oval beside the compound word.

○ ACROBAT

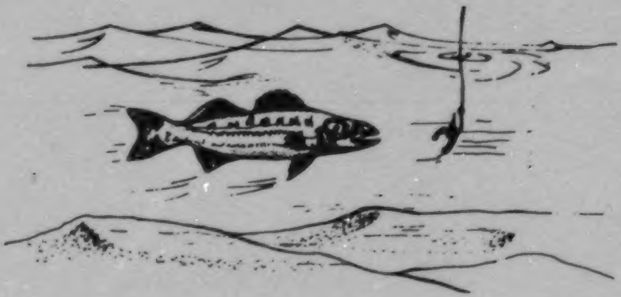
● CLASSROOM

○ SEPARATE

○ SUMMER

○ I don't know.

AGE LEVEL:	9	13
RELEASE NO:	203	203
PACKAGE-EXERCISE NOS:	2-2	13-5
OBJECTIVE:	IV A	
THEME:	2. Reading and Visual Aids A. Interpreting Drawings and Pictures	
IDENTICAL OR SIMILAR PASSAGES:	None	
MODE OF ADMINISTRATION:	Group Directions - Tape recorded Stem - Read by respondent Response - Written by respondent	
TIME OF ADMINISTRATION:	Age 9: 1 1/4 minutes Age 13: 1/2 minute	
COPYRIGHT REQUIREMENT:	No	



Look at the picture and fill in the oval beside the sentence which tells BEST what the drawing shows.

○ The fish has already eaten the worm.

○ The worm is probably not on a hook and line.

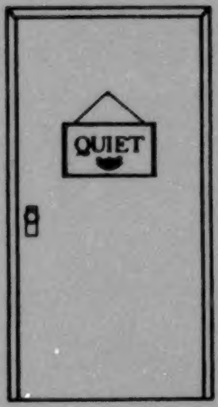
● The fish looks as if he is going to eat the worm.

○ The fish is waiting for the worm to be put in the water.

○ I don't know.

Selected NAEP Reading Items

AGE LEVEL:	9	13
RELEASE NO:	206	206
PACKAGE-EXERCISE NOS:	3-2	3-15
OBJECTIVE:	I Blc	
THEME:	2. Reading and Visual Aids A. Interpreting Drawings and Pictures	
IDENTICAL OR SIMILAR PASSAGES:	None	
MODE OF ADMINISTRATION:	Group Directions - Tape recorded Stem - Read by respondent Response - Written by respondent	
TIME OF ADMINISTRATION:	Age 9: 3/4 minute Age 13: 3/4 minute	
COPYRIGHT REQUIREMENT:	No	



Look at the picture and fill in the oval beside the sentence which tells BEST what the drawing shows.

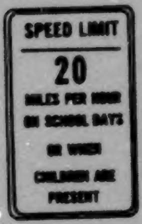
○ A sign is hanging by the door.
● A sign is hanging on the door.
○ A sign is hanging over the door.
○ A sign is hanging near the door.

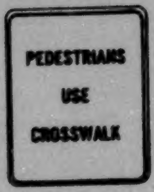
○ I don't know.

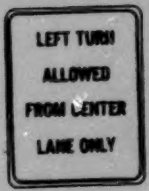
AGE LEVEL:	9	13
RELEASE NO:	208	208
PACKAGE-EXERCISE NOS:	4-6	8-5
OBJECTIVE:	I Clb	
THEME:	2. Reading and Visual Aids B. Reading Signs and Labels	
IDENTICAL OR SIMILAR PASSAGES:	None	
MODE OF ADMINISTRATION:	Group Directions - Tape recorded Stem - Read by respondent Response - Written by respondent	
TIME OF ADMINISTRATION:	Age 9: 1 minute Age 13: 3/4 minute	
COPYRIGHT REQUIREMENT:	No	

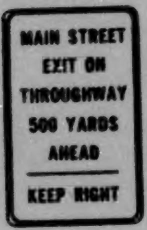
Some road signs tell people who are driving cars what to do. Other signs tell people who are walking what to do.

If you are walking, which sign tells you what to do? Fill in the oval beside the correct sign.

○

SPEED LIMIT
20
MILES PER HOUR
ON SCHOOL DAYS
OR WHEN
CHILDREN ARE
PRESENT

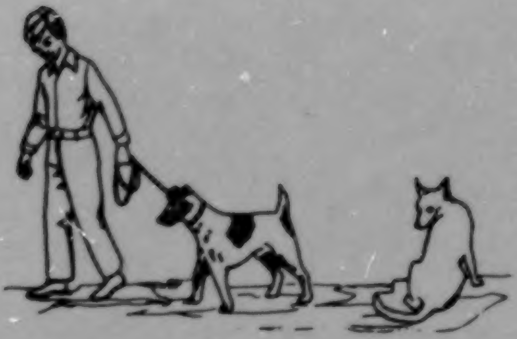
●

PEDESTRIANS
USE
CROSSWALK

○

LEFT TURN
ALLOWED
FROM CENTER
LANE ONLY

○

MAIN STREET
EXIT ON
THROUGHWAY
500 YARDS
AHEAD
KEEP RIGHT

○ I don't know.

E LEVEL:	9	13
LEASE NO:	318	318
CKAGE-EXERCISE NOS:	5-6	6-4
JECTIVE:	I B2	
EME:	3. Reading and Visual Aids A. Interpreting Drawings and Pictures	
ENTICAL OR SIMILAR PASSAGES:	None	
DE OF ADMINISTRATION:	Group Directions - Tape recorded Stem - Read by respondent Response - Written by respondent	
ME OF ADMINISTRATION:	Age 9: 1 1/3 minutes Age 13: 3/4 minute	
PYRIGHT REQUIREMENT:	No	



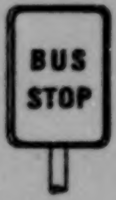
Look at the picture and fill in the oval beside the sentence which tells BEST what the drawing shows.

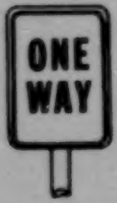
○ The boy has two dogs on a leash.
○ The boy is walking behind his dog.
● The dog on the leash has spots on it.
○ The dog sitting down has spots on it.

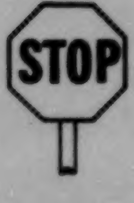
○ I don't know.

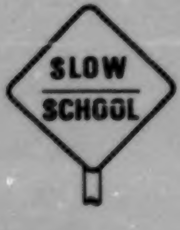
AGE LEVEL:	9
RELEASE NO:	313
PACKAGE-EXERCISE NO:	7-1
OBJECTIVE:	I A3
THEME:	3. Reading and Visual Aids B. Reading Signs and Labels
IDENTICAL OR SIMILAR PASSAGES:	None
MODE OF ADMINISTRATION:	Group Directions - Tape recorded Stem - Read by respondent Response - Written by respondent
TIME OF ADMINISTRATION:	3/4 minute
COPYRIGHT REQUIREMENT:	No

Fill in the oval beside the sign that a boy might look for if he needed to take a bus home.

● 

○ 

○ 

○ 

○ I don't know.

AGE LEVEL:		9	13	17
RELEASE NO:	A.	21401	21401	21401
	B.	21402	21402	21402
	C.	21403	21403	21403
	D.	21404	21404	21404
	E.	21405	21405	21405
	b.	21406	21406	21406
PACKAGE-EXERCISE NOS:		8-6	10-3	6-6

OBJECTIVE: III C4(3)

THEME: 3. Reading and Visual Aids
C. Reading Charts, Maps and Graphs

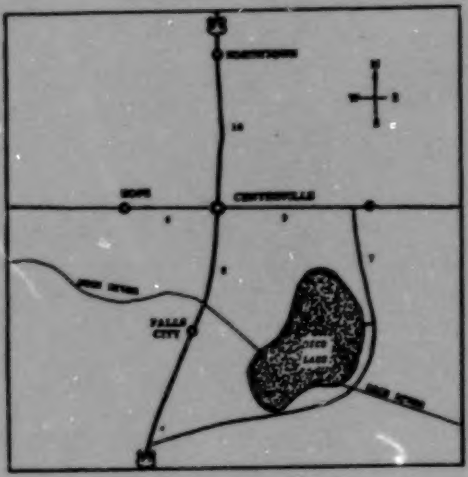
IDENTICAL OR SIMILAR PASSAGES: None

MODE OF ADMINISTRATION: Group
Directions - Tape recorded
Stem - Read by respondent
Response - Written by respondent

TIME OF ADMINISTRATION: Age 9: 3 minutes
Age 13: 3 minutes
Age 17: 2 3/4 minutes

COPYRIGHT REQUIREMENTS: No

Look at the road map and read each sentence carefully. If what the sentence says is true, fill in the oval beside "True." If what the sentence says is not true, fill in the oval beside "False." If you can't decide if the sentence is true or false, fill in the oval beside "I don't know."



(continued on next page)

AGE LEVEL:		9	13
RELEASE NO:	A.	30301	30301
	B.	30302	30302
	C.	30303	30303
	D.	30304	30304
	b.	30305	30305
PACKAGE-EXERCISE NOS:		1-17	8-13

OBJECTIVE: III B2

THEME: 3. Following Written Directions
B. Carrying out Written Directions

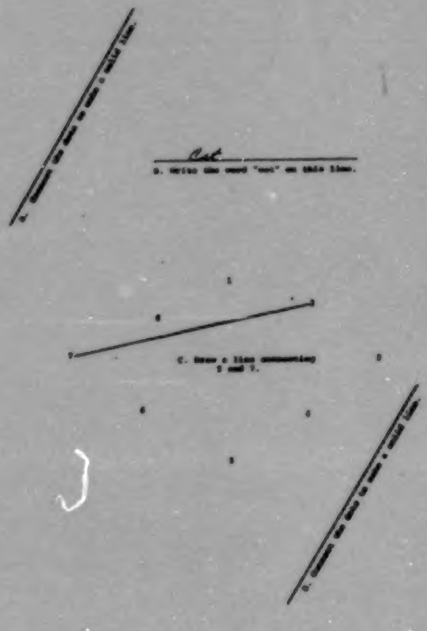
IDENTICAL OR SIMILAR PASSAGES: None

MODE OF ADMINISTRATION: Group
Directions - Tape recorded
Stem - Read by respondent
Response - Written by respondent

TIME OF ADMINISTRATION: Age 9: 3 minutes
Age 13: 3 minutes

COPYRIGHT REQUIREMENT: No

To the right you will see four directions which you are to follow. Do as many as you can in the time you are given.


Cat
B. Write the word "cat" on this line.
C. Draw a line connecting 3 and 7.
3
7

Selected NAEP Reading Items

AGE LEVEL:		9	13	17	A
RELEASE NO:	1.	41201	41201(e)	41201	41201
	2.	41202	41202(e)	41202	41202
	A.	41203	41203(e)	41203	41203
	B.	41204	41204(e)	41204	41204
	C.	41205	41205(e)	41205	41205
	D.	41206	41206(e)	41206	41206
	E.	41207	41207(e)	41207	41207
	b.	41208	41208(e)	41208	41208
PACKAGE-EXERCISE NOS:		10-2	15-2	13-2	2-1

OBJECTIVE:
A. III C3(1), I A1
B. III C3(1), I A1a
C. III C3(1), I A1a
D. III C3(1), I A1a
E. III C3(1), I A1

THEME:
4. Reading and Reference Materials
B. Use of Reference Materials

IDENTICAL OR SIMILAR PASSAGES: None

MODE OF ADMINISTRATION: Individual
Directions - Read by Interviewer
Stem - Read by Interviewer
Response - Oral by respondent
Written by Interviewer

TIME OF ADMINISTRATION:
Age 9: 4 minutes
Age 13: 6 minutes
Age 17: 4 minutes
Adult: 4 minutes

COPYRIGHT REQUIREMENT: No

(Give dictionary to student.

Ask the first two questions and record the main points of his responses.)

First ask: "What is a dictionary?"* ______________________

____

*(Dictionary: "A book that tells you what words mean."
"A book that tells you how to use words.")

Then ask: "What does the word 'define' mean?"** ______________________

____

**(Define: "To give the meaning of words," or
"To tell what the word means.")

(If the student defines both words correctly, read A-E to him and record his answers, even if he cannot do some or all of the tasks. If he cannot define one or both of the words, give him the definition(s), using the dictionary and showing him a word and its definition if necessary, then continue with A.

If he answers A, either correctly or incorrectly, continue with B-E. If he cannot answer A, give him the definition(s) once more and repeat A. If he then answers A, either correctly or incorrectly, continue with B-E. If he stops working, encourage him to continue. If he still cannot answer A, discontinue, explain the situation in A, and go to the next exercise.)

*A. Open the book to page 15 and tell me any three words defined on that page.

1. Allied
2. Allowance
3. Aloe

B. Tell me the last word defined in the "P" section.

Pygmy

C. Tell me the number of the last page in the dictionary.

632

D. Tell me the number of the page on which you can find out what the word "bake" means.

41

E. Tell me the word which is defined just before the word "house" and the word which is defined just after the word "house."

Just before Hourly
Just after Houseboat

*Other Acceptable Responses

A. alligator, alliteration, allocate, allot, allow, allowance, alloy, all right, allround, allspice, allude, allure, allusion, aluminum, ally, alma mater, almighty, almond, almost, alms, alms house, aloft, aloha, along, alongside, aloof, aloud, alp, alpaca, alpha, alphabet

Selected NAEP Reading Items

GE LEVEL:	9
ELEASE NO:	320
ACKAGE-EXERCISE NO:	8-2
BJECTIVE:	I C1b
HEME:	5. Reading for Significant Facts A. Recognizing Factual Information
DENTICAL OR SIMILAR PASSAGES:	Age 9: 2-4, 5-1, 6-5, 9-6
ODE OF ADMINISTRATION:	Group Directions - Tape recorded Stem - Read by respondent Response - Written by respondent
IME OF ADMINISTRATION:	1 minute
OPYRIGHT REQUIREMENT:	No

Read the story and complete the sentence which follows it.

The wind pushed the boat farther and farther out to sea. It started to rain and the fog grew thick. The boy and his father were lost at sea.

The weather was

○ calm.
○ dry.
○ sunny.
● wet.

○ I don't know.

AGE LEVEL:	9
RELEASE NO:	714
PACKAGE-EXERCISE NO:	5-1
OBJECTIVE:	I C1b
THEME:	7. Reading and Drawing Inferences A. Drawing Inferences from Information Given
IDENTICAL OR SIMILAR PASSAGES:	Age 9: 2-4, 6-5, 8-2, 9-6
MODE OF ADMINISTRATION:	Group Directions - Tape recorded Stem - Read by respondent Response - Written by respondent
TIME OF ADMINISTRATION:	1 minute
COPYRIGHT REQUIREMENT:	No

Read the story and answer the question which follows it.

The wind pushed the boat farther and farther out to sea. It started to rain and the fog grew thick. The boy and his father were lost at sea.

At least how many people were in the boat?

○ One
● Two
○ Three
○ Four
○ Five

○ I don't know.

SELECTED NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS (NAEP)

Mathematics Items

Preliminary exercise data supplied by the NAEP were examined to identify mathematics exercises with the same characteristics as those selected for Reading, i.e., NAEP items for which no copyright release is requested, and for which the national percentage of 9 years old, responding correctly was 85% and percentage of inner city (low metro) pupils was 40%. The criteria for the national group were found to be too restrictive. Successive passes through the data were made lowering the criteria for the national group by intervals of 5 percentage points. The set of items finally accepted were selected from four of the fifteen content areas tested. They are:

A. Number of Numeration Concepts
B. Properties of Numbers and Operations
C. Arithmetic Computation
E. Estimation and Measurement
H. Equations and Inequalities
K. Geometry

We have included for each exercise a page showing the exercise itself and a documentation page showing content area, objective, exercise type, scoring type, administration mode, age group, national P-value and timing (in seconds). Total test time for the 24 items is 20 minutes.

What digit is in the tens place in 4,263?

○ 2

○ 3

○ 4

● 6

○ I don't know.

RA01
OBJ 1

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO.

Report #: RA01

NAEP #: A11001-1

Content Area: A. NUMBER AND NUMERATION CONCEPTS

Objective: I. Recall and/or Recognition of Definitions, Facts, and Symbols.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: 9
Package-Exercise: 03-29
National P-value:
RA01 75.21

Timing: (in seconds)
Stimulus: 10
Response: 7
I don't know: 5
Pause: 6
RA01 Exercise total: 28

762 =

○ 7 + 6 + 2.

○ 7 + 60 + 200.

● 700 + 60 + 2.

○ 70 + 60 + 20.

○ I don't know.

RA02
OBJ III

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO.

Report #: RA02

NAEP #: A11014-1

Content Area: A. NUMBER AND NUMERATION CONCEPTS

Objective: III. Understand Mathematical Concepts and Processes.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: 9
Package-Exercise: 07-10
National P-value:
RA02 74.25

Timing: (in seconds)
Stimulus: 5
Response: 21
I don't know: 5
Pause: 5
RA02 Exercise total: 36

The first three odd numbers are 1, 3, and 5. What is the next odd number after 5?

ANSWER ______________________

RA04
OBJ V

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO.

1004-1

Report #: RA04

NAEP #: A21004-1

Content Area: A. NUMBER AND NUMERATION CONCEPTS

Objective: V. Using Mathematics and Mathematical Reasoning To Analyze Problem Situations, Define Problems, Formulate Hypotheses, Make Decisions, and Verify Results.

Exercise Type: Short answer
Scoring Type: Semi-professional
Administration Mode: Group

Age:		9
Package-Exercise:		02-03
National P-value:		
	RA04	80.30

Timing: (in seconds)

	Stimulus:	8
	Response:	11
RA04	Exercise total:	19

SCORING GUIDE
RA04
A21004-1

00 = No Response

10 = 7

11 = 7,9,11

12 = Gives 7 first plus other odd number(s); e.g., 7,9; 7,11; 7,9,13

20 = 9

21 = 6; 6,7,...(increments by 1 each time)

22 = "2,4,6"

23 = 3

24 = Other Unacceptable

39 = I Don't Know.

Counting by 10's, what number comes next?

10, 20, 30, _____

ANSWER ____________________________

RA06
OBJ 1

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO.

Report #: RA06

NAEP #: A21011-1

Content Area: A. NUMBER AND NUMERATION CONCEPTS

Objective: I. Recall and/or Recognition of Definitions, Facts, and Symbols.

Exercise Type: Short answer
Scoring Type: Semi-professional
Administration Mode: Group

Age:		9
Package-Exercise:		03-18
National P-value:		
	RA06	93.78

Timing: (in seconds)

	Stimulus:	6
	Response:	12
RA06	Exercise total:	18

SCORING GUIDE
RA06
A21011-1

00 = No Response

10 = 40; 10,20,30,40

11 = Any response by 10's beginning with 40; e.g., 40,50

20 = Other Unacceptable

21 = 20

39 = I Don't Know.

Which one of the following is the sum of three hundreds, eight tens, and four ones?

○ 15

● 384

○ 300,804

○ I don't know.

RA07
OBJ 0

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO

Selected NAEP Mathematics Items

Report #: RA07

NAEP #: A21016-12

Content Area: A. NUMBER AND NUMERATION CONCEPTS

Objective: III. Understand Mathematical Concepts and Processes.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

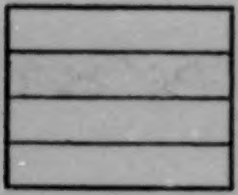
Age:		9	13
Package-Exercise:		04-33	09-13
National P-value:			
	RA07	73.81	91.36

Timing: (in seconds)

	Stimulus:	9	10
	Response:	31	31
	I don't know:	5	5
	Pause:	6	6
RA07	Exercise total:	51	52

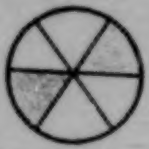
Selected NAEP Mathematics Items

A. What fractional part of the figure below is shaded?



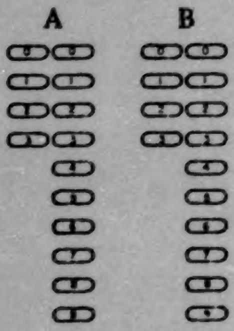
ANSWER ____________________

B. What fractional part of the figure below is shaded?



ANSWER ____________________

RA10
OBJ III

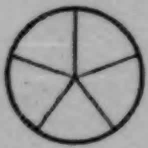


STOP DO NOT CONTINUE UNTIL TOLD TO DO SO.

-1

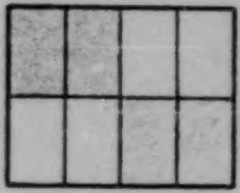
(Continued)

C. What fractional part of the figure below is shaded?



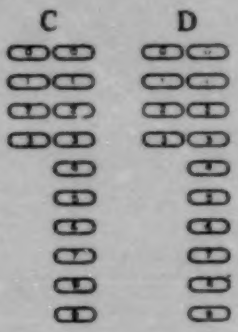
ANSWER ____________________

D. What fractional part of the figure below is shaded?



ANSWER ____________________

RA1Ø
OBJ III



STOP DO NOT CONTINUE UNTIL TOLD TO DO SO

Report #: RA10

NAEP #: A23004-1

Content Area: A. NUMBER AND NUMERATION CONCEPTS

Objective: III. Understand Mathematical Concepts and Processes.

Exercise Type: Multiple part short answer using drawings
Scoring Type: Semi-professional
Administration Mode: Group

Age: 9
Package-Exercise: 02-26
National P-value:

RA10A	30.80
RA10B	31.30
RA10C	30.60
RA10D	36.70

Timing: (in seconds)

	Stimulus:	5
	Response:	26
RA10A	Part total:	31
	Stimulus:	4
	Response:	26
	Turn page:	(6)
RA10B	Part total:	30**
	Stimulus:	3
	Response:	26
RA10C	Part total:	29
	Stimulus:	4
	Response:	26
RA10D	Part total:	30
RA10	Exercise total:	120

**Time to turn page is not included in total times.

SCORING GUIDE
RA10
A23004-1

Part A. 00 = No Response

10 = 1/4; .25; 25%; a quarter; 1 out of 4

20 = Attempt to name shaded part; e.g., second, 1, rectangle

21 = Other Unacceptable

22 = 1/3; 3/1; 1-3

39 = I Don't Know.

Part B. 00 = No Response

10 = 1/3; .33; 33%; one-third; 2/6; two-sixths; 2 out of six

20 = Attempt to name shaded part; e.g., 2-5, 1-4, triangles

21 = Other Unacceptable

22 = 2/4; 4/2; 4-2; 2-4

39 = I Don't Know.

SCORING GUIDE
RA10
A23004-1

Part C. 00 = No Response

10 = 2/5; .40; 40%; 2 out of 5; two-fifths

20 = Attempt to name shaded parts; e.g., left ones, one side, triangles

21 = Other Unacceptable

22 = 2/3; 3/2; 2-3; 3-2

39 = I Don't Know.

Part D. 00 = No Response

10 = 1/2; .50; 50%; a half; 2/4; two quarters; 4/8; 4 out of 8

20 = Attempt to name shaded parts; e.g., 2 half-rows, corner ones, 1,2,7,8, rectangles

21 = Other Unacceptable

22 = 4/4; 4-4; 2/2; 2-2

39 = I Don't Know.

A candy bar is broken into three pieces of the same size. Each piece is what part of the candy bar?

ANSWER ______________________________

RA12
OBJ 11

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO.

Report #: RA12

NAEP #: A23011-1

Content Area: A. NUMBER AND NUMERATION CONCEPTS

Objective: II. Perform Mathematical Manipulations.

Exercise Type: Short answer
Scoring Type: Semi-professional
Administration Mode: Group

Age:		9
Package-Exercise:		01-02
National P-value:		
	RA12	19.90

Timing: (in seconds)

	Stimulus:	6
	Response:	16
RA12	Exercise total:	22

SCORING GUIDE
RA12
A23011-1

00 = No Response

10 = 1/3; .33; 33%; one third

20 = 3; 3 pieces

21 = End, middle, end; 2 sides and middle; 2 sides; middle; ends; left

22 = Other Unacceptable

39 = I Don't Know.

Selected NAEP Mathematics Items

A. Which number is GREATER?

● 3,000,000

○ 800,000

○ I don't know.

B. Which number is GREATER?

○ 3,000

● 3,200

○ I don't know.

RB02
OBJ 1

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO.

Selected NAEP Mathematics Items

Report #: RB02

NAEP #: B11010-12

Content Area: B. PROPERTIES OF NUMBERS AND OPERATIONS

Objective: I. Recall and/or Recognition of Definitions, Facts, and Symbols.

Exercise Type: Multiple part multiple choice
Scoring Type: Machine
Administration Mode: Group

Age:		9	13
Package-Exercise:		02-24	08-30
National P-value:			
	RB02A	81.93	95.92
	RB02B	85.84	96.80

Timing: (in seconds)

		9	13
	Stimulus:	6	6
	Response:	16	16
	I don't know:	5	5
	Pause:	6	6
RB02A	Part total:	33	33
	Stimulus:	6	6
	Response:	16	17
	I don't know:	5	5
	Pause:	6	6
RB02B	Part total:	33	34
RB02	Exercise total:	66	67

Do each of the problems below.

A. 3 + 0 =

A. ANSWER ______________________

B. 3 × 0 =

B. ANSWER ______________________

C. 3 - 0 =

C. ANSWER ______________________

R803
OBJ II

A	B	C
○ ○	○ ○	○ ○
○ ○	○ ○	○ ○
○ ○	○ ○	○ ○
○ ○	○ ○	○ ○
○	○	○
○	○	○
○	○	○
○	○	○
○	○	○
○	○	○

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO.

Selected NAEP Mathematics Items

Report #: RB03

NAEP #: B12005-12

Content Area: B. PROPERTIES OF NUMBERS AND OPERATIONS

Objective: II. Perform Mathematical Manipulations.

Exercise Type: Multiple part short answer
Scoring Type: Semi-professional
Administration Mode: Group

Age:		9	13
Package-Exercise:		06-32	05-04
National P-value:			
	RB03A	94.26	98.14
	RB03B	81.49	94.75
	RB03C	87.76	94.15

Timing: (in seconds)

	Introduction:	3	3
	Stimulus:	3	3
	Response:	16	15
RB03A	Part total:	19	18
	Stimulus:	3	3
	Response:	17	15
RB03B	Part total:	20	18
	Stimulus:	4	3
	Response:	16	16
RB03C	Part total:	20	19
RB03	Exercise total:	62	58

SCORING GUIDE
RB03
B12005-12

Part A. 00 = No Response

10 = 3

20 = 0

21 = Other Unacceptable

39 = I Don't Know.

Part B. 00 = No Response

10 = 0

20 = 3

21 = Other Unacceptable

39 = I Don't Know.

Part C. 00 = No Response

10 = 3

20 = 0

21 = Other Unacceptable

39 = I Don't Know.

Which one of the following is equal to 3 X 5?

○ 3 + 3 + 3

○ 5 + 5 + 5 + 5 + 5

● 3 + 3 + 3 + 3 + 3

○ 3 + 5 + 3 + 5 + 3 + 5

○ I don't know.

RB04
OBJ II

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO.

Report #: RB04

NAEP #: B12008-1

Content Area: B. PROPERTIES OF NUMBERS AND OPERATIONS

Objective: II. Perform Mathematical Manipulations.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: 9
Package-Exercise: 05-28
National P-value:
RB04 73.29

Timing: (in seconds)
Stimulus: 7
Response: 31
I don't know: 5
Pause: 6
RB04 Exercise total: 49

$$\begin{array}{r} 315 \\ -179 \\ \hline 136 \end{array}$$

What two numbers could you add to check this subtraction?

ANSWER ______________ **and** ______________

R805

OBJ II

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO

Report #: RB06

NAEP #: B13001-1234

Content Area: B. PROPERTIES OF NUMBERS AND OPERATIONS

Objective: II. Perform Mathematical Manipulations.

Exercise Type: Short answer
Scoring Type: Semi-professional
Administration Mode: Group

Age:		9	13	17	Adult
Package-Exercise:		05-33	02-02	09-11	02-02
National P-value:					
	RB06	41.90	82.17	88.22	86.29
Timing: (in seconds)					
	Stimulus:	11	11	10	11
	Response:	19	21	20	*
RB06	Exercise total:	30	32	30	*

*Time not limited by paced tape.

SCORING GUIDE
RB06
B13001-1234

00 = No Response

10 = 179 and 136; 136 and 179; 136 + 179; 179 + 136

11 = Has 139 or 163 for 136 plus 179; has 176 or 197 for 179 plus 136

20 = 315 + 136; 315 + 179

21 = Other Unacceptable

39 = I Don't Know.

Note: Only Category 10 was considered acceptable.

Which fraction is the GREATEST?

○ $\frac{2}{3}$

○ $\frac{3}{4}$

● $\frac{4}{5}$

○ $\frac{5}{8}$

○ I don't know.

RB10
OBJ IV

STOP DO NOT CONTINUE
UNTIL TOLD TO DO S

Selected NAEP Mathematics Items

Report #: RB10

NAEP #: B22017-123

Content Area: P. PROPERTIES OF NUMBERS AND OPERATIONS

Objective: IV. Solving Mathematical Problems--Social, Technical, and Academic.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age:		9	13	17
Package-Exercise:		06-21	02-27	04-12
National P-value:				
	RB10	3.22	26.18	49.16

Timing: (in seconds)

	Stimulus:	7	8	8
	Response:	119	99	99
	I don't know:	5	5	5
	Pause:	6	6	6
RB10	Exercise total:	137	118	118

Selected NAEP Mathematics Items

Add the following numbers:

```
$ 3.06
 10.00
  9.14
  5.10
──────
```

ANSWER ____________________

RC01

OBJ II

○ ○
○ ○
○ ○
○ ○
○
○
○
○
○
○

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO.

10011-1,2,3,4

Selected NAEP Mathemtics Items

Report #: RC01

NAEP #: C10011-1234

Content Area: C. ARITHMETIC COMPUTATION

Objective: II. Perform Mathematical Manipulations.

Exercise Type: Short answer
Scoring Type: Semi-professional
Administration Mode: Group

Age:		9	13	17	Adult
Package-Exercise:		06-04	01-26	02-01	06-01
National P-value:					
	RC01	39.85	84.34	92.45	86.18
Timing: (in seconds)					
	Stimulus:	1	1	1	1
	Response:	41	31	31	*
RC01	Exercise total:	42	32	32	*

*Time not limited by paced tape.

SCORING GUIDE
RC01
C10011-1234

00 = No Response

10 = $27.30

11 = 27.30

20 = 2730; $2730 (any decimal error)

21 = 27.20; $27.20; 17.30; $17.30 (can misplace decimal)

22 = 17.20; $17.20 (can misplace decimal)

23 = 117210; $117210 (can misplace decimal); 11721

24 = Other Unacceptable

39 = I Don't Know.

Selected NAEP Mathematics Items

Do the problems on this and the following page.

A. **Add:**

$$\begin{array}{r} 38 \\ +19 \\ \hline \end{array}$$

ANSWER ______________________

B. **Subtract:**

$$\begin{array}{r} 36 \\ -19 \\ \hline \end{array}$$

ANSWER ______________________

RC02

OBJ 11

A		B	
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
	4		4
	5		5
	6		6
	7		7
	8		8
	9		9

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO.

Selected NAEP Mathemtics Items

(Continued)

C. Multiply:

$$\begin{array}{r} 38 \\ \underline{\times\ 9} \end{array}$$

ANSWER ____________________

D. Divide:

$$5\overline{)125}$$

ANSWER ____________________

RC02

OBJ II

C		D	
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
	4		4
	5		5
	6		6
	7		7
	8		8
	9		9

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO

S-C10017-1,2,3,4

Selected NAEP Mathematics Items

Report #: RC02

NAEP #: C10017-1234

Content Area: C. ARITHMETIC COMPUTATION

Objective: II. Perform Mathematical Manipulations.

Exercise Type: Multiple part short answer
Scoring Type: Semi-professional
Administration Mode: Group

Age:		9	13	17	Adult
Package-Exercise:		01-05	06-13	07-09	01-14
National P-value:					
	RC02A	79.00	94.30	96.76	96.91
	RC02B	55.03	88.90	91.58	91.48
	RC02C	25.23	82.56	87.47	80.75
	RC02D	15.23	88.53	93.17	92.77

Timing: (in seconds)

	Introduction:	4	4	4	4
	Stimulus:	2	2	1	1
	Response:	30	30	30	*
RC02A	Part total:	32	32	31	*
	Stimulus:	2	2	2	1
	Response:	30	31	31	*
	Turn page:	(6)	(6)	(6)	*
RC02B	Part total:	32**	33**	33**	*
	Stimulus:	2	1	1	1
	Response:	30	31	31	*
RC02C	Part total:	32	32	32	*
	Stimulus:	1	2	1	2
	Response:	31	31	31	*
RC02D	Part total:	32	33	32	*
RC02	Exercise total:	132	134	132	*

*Time not limited by paced tape.

**Time to turn page is not included in total times.

SCORING GUIDE
RC02
C10017-1234

Part A. 00 = No Response

10 = 57

20 = 417

21 = 47

22 = 19; 29

23 = Other Unacceptable

39 = I Don't Know.

Part B. 00 = No Response

10 = 17

20 = 27

21 = 55

22 = 45

23 = Other Unacceptable

24 = 23

39 = I Don't Know.

SCORING GUIDE
RC02
C10017-1234

Part C. 00 = No Response

10 = 342

20 = 272

21 = 2772

22 = 297

23 = Other Unacceptable; e.q., 972, 432

39 = I Don't Know.

Part D. 00 = No Response

10 = 25

20 = 21

21 = Other Unacceptable

39 = I Don't Know.

Do the following subtraction:

$$\begin{array}{r} 1{,}054 \\ -\ 865 \\ \hline \end{array}$$

ANSWER ______________________

RC04

OBJ II

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO

5-C10021-1,2,3,4

Report #: RC04

NAEP #: C10021-1234

Content Area: C. ARITHMETIC COMPUTATION

Objective: II. Perform Mathematical Manipulations.

Exercise Type: Short answer
Scoring Type: Semi-professional
Administration Mode: Group

Age:		9	13	17	Adult
Package-Exercise:		02-06	02-31	08-09	06-17
National P-value:					
	RC04	27.17	80.02	88.84	89.71

Timing: (in seconds)					
	Stimulus:	2	1	1	2
	Response:	40	40	41	*
RC04	Exercise total:	42	41	42	*

*Time not limited by paced tape.

SCORING GUIDE
RC04
C10021-1234

00 = No Response

10 = 189

20 = 299

21 = 199; 289

22 = Any attempt to add; e.g., 1919; 18119; 1819

23 = Other Unacceptable

24 = 211; -211; 1811; -1811; 11; -11; 811; -811

25 = 1189; 1299; 1199; 1289

39 = I Don't Know.

Betty's dog eats two biscuits every day. How many days will it take the dog to finish a package of 24 biscuits?

ANSWER ______________________

RC07

OBJ IV

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO.

Report #: RC07

NAEP #: C10036-1

Content Area: C. ARITHMETIC COMPUTATION

Objective: IV. Solving Mathematical Problems--Social, Technical, and Academic.

Exercise Type: Short answer
Scoring Type: Semi-professional
Administration Mode: Group

Age: 9
Package-Exercise: 05-01
National P-value:
RC07 36.71

Timing: (in seconds)
Stimulus: 8
Response: 30
RC07 Exercise total: 38

SCORING GUIDE
RC07
C10036-1

00 = No Response

10 = 12; 12 days

11 = 12 with wrong units; e.g., 12 biscuits

12 = 24/2; attempt to divide 24 by 2

20 = 22 (days); attempt to subtract 2 from 24

21 = 26 (days); attempt to add 24 and 2

22 = 48 (days); attempt to multiply 24 by 2

23 = 24

24 = Other Unacceptable

39 = I Don't Know.

Note: Only Categories 10 and 11 were considered acceptable.

$10 \times 10 \times 10 \times 10 =$

ANSWER ____________________

RC09
OBJ II

○ ○
○ ○
○ ○
○ ○
○
○
○
○
○
○

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO

Selected NAEP Mathematics Items

Report #: RC09

NAEP #: C10057-123

Content Area: C. ARITHMETIC COMPUTATION

Objective: II. Perform Mathematical Manipulations.

Exercise Type: Short answer
Scoring Type: Semi-professional
Administration Mode: Group

Age:		9	13	17
Package-Exercise:		06-25	03-30	11-27
National P-value:				
	RC09	4.27	67.07	79.71

Timing: (in seconds)

	Stimulus:	4	4	4
	Response:	26	27	26
RC09	Exercise total:	30	31	30

SCORING GUIDE
RC09
C10057-123

00 = No Response

10 = 10,000; 10000

11 = 10 to the 4th power

20 = 40; 400; 4000; 40,000

21 = 200

22 = 10... where the number of 0's is not 4

23 = Other Unacceptable

39 = I Don't Know.

Selected NAEP Mathematics Items

Report #: RC14

NAEP #: C20008-1

Content Area: C. ARITHMETIC COMPUTATION

Objective: III. Understand Mathematical Concepts and Processes.

Exercise Type: Short answer using graph, table or drawing
Scoring Type: Semi-professional
Administration Mode: Group

Age: 9
Package-Exercise: 05-23
National P-value:
RC14 21.37

Timing: (in seconds)
Stimulus: 6
Response: 30
RC14 Exercise total: 36

SCORING GUIDE
RC14
C20008-1

00 = No Response

10 = 6; 6 dots; 6 circles

11 = 3/4; 3/4 of the dots (or circles)

20 = 2; 2 dots (or circles)

21 = 4; 4 dots (or circles); 1/2; 1/2 of the dots (or circles)

22 = 1/4; 1/4 of the dots (or circles)

23 = Other Unacceptable

39 = I Don't Know.

Do the following multiplication:

$\frac{1}{2} \times \frac{1}{4} =$

ANSWER ____________________

RC16

OBJ II

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO.

5-C 20022-2,3

Report #: RC16

NAEP #: C20022-23

Content Area: C. ARITHMETIC COMPUTATION

Objective: II. Perform Mathematical Manipulations.

Exercise Type: Short answer
Scoring Type: Semi-professional
Administration Mode: Group

Age:		13	17
Package-Exercise:		05-26	09-02
National P-value:			
	RC16	62.25	73.51
Timing: (in seconds)			
	Stimulus:	2	2
	Response:	20	19
RC16	Exercise total:	22	21

SCORING GUIDE
RC16
C20022-23

00 = No Response

10 = 1/8

20 = 2/8; 1/4

21 = 3/4

22 = 8

23 = 2/4; 1/2; 4/8

24 = Other Unacceptable

25 = 1/6

39 = I Don't Know.

John has 382 stamps in his stamp collection, Greg has 224, Pete has 310 and Bob has 175. The number of stamps the boys have altogether is CLOSEST to which one of the following numbers?

○ 900
○ 1000
● 1100
○ 1200

○ I don't know.

RC21
OBJ IV

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO.

Report #: RC21

NAEP #: C60001-1

Content Area: C. ARITHMETIC COMPUTATION

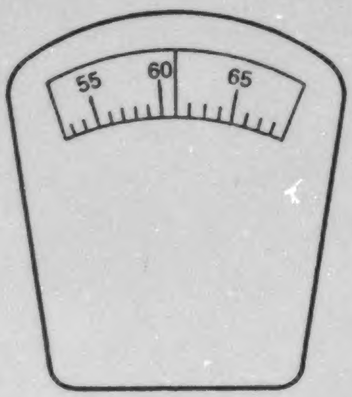
Objective: IV. Solving Mathematical Problems--Social, Technical, and Academic.

Exercise Type: Multiple choice
Scoring Type: Machine
Administration Mode: Group

Age: 9
Package-Exercise: 05-30
National P-value:
RC21 30.57

Timing: (in seconds)
Stimulus: 28
Response: 31
I don't know: 5
Pause: 6
RC21 Exercise total: 70

A person is standing on the scale below weighing himself. How much does he weigh?



○ 59 pounds

● 61 pounds

○ 62 pounds

○ 63 pounds

○ I don't know.

RE12

OBJ II

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO.

Report #: RE12

NAEP #: E14012-12

Content Area: E. ESTIMATION AND MEASUREMENT

Objective: II. Perform Mathematical Manipulations.

Exercise Type: Multiple choice using graph, table, or drawing
Scoring Type: Machine
Administration Mode: Group

Age:		9	13
Package-Exercise:		02-33	04-16
National P-value:			
	RE12	80.03	91.02
Timing: (in seconds)			
	Stimulus:	15	14
	Response:	15	16
	I don't know:	5	5
	Pause:	6	6
RE12	Exercise total:	41	41

$$3 + \square = 10$$

Replace the box with a number to make the above statement **TRUE**.

ANSWER ____________________

RH01

OBJ III

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO

Report #: RH01

NAEP #: H11001-1

Content Area: H. EQUATIONS AND INEQUALITIES

Objective: III. Understand Mathematical Concepts and Processes.

Exercise Type: Short answer
Scoring Type: Semi-professional
Administration Mode: Group

Age:		9
Package-Exercise:		03-21
National P-value:		
	RH01	89.88

Timing: (in seconds)

	Stimulus:	4
	Response:	26
RH01	Exercise total:	30

SCORING GUIDE
RH01
H11001-1

00 = No Response

10 = 7

11 = Correct process with no answer or wrong answer; e.g., 10 - 3

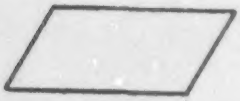
20 = 13; any attempt to add

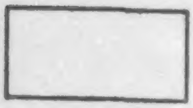
21 = Other Unacceptable; e.g., 17

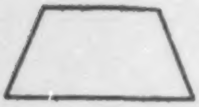
39 = I Don't Know.

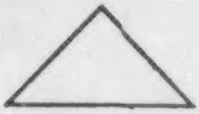
Note: Only Category 10 was considered acceptable.

Which one of the following figures is a rectangle?

○ 

● 

○ 

○ 

○ I don't know.

RK05
OBJ I

STOP DO NOT CONTINUE
UNTIL TOLD TO DO SO.

Report #: RK05

NAEP #: K20001-1

Content Area: K. GEOMETRY

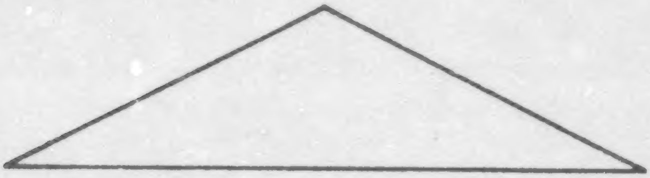
Objective: I. Recall and/or Recognition of Definitions, Facts, and Symbols.

Exercise Type: Multiple choice using graph, table, or drawing
Scoring Type: Machine
Administration Mode: Group

Age:		9
Package-Exercise:		03-14
National P-value:		
	RK05	74.03

Timing: (in seconds)

	Stimulus:	6
	Response:	20
	I don't know:	5
	Pause:	6
RK05	Exercise total:	37



What is the figure above called?

ANSWER ______________________

RK09
OBJ 1

STOP DO NOT CONTINUE UNTIL TOLD TO DO SO.

Report #: RK09

NAEP #: K20041-1

Content Area: K. GEOMETRY

Objective: I. Recall and/or Recognition of Definitions, Facts, and Symbols.

Exercise Type: Short answer using graph, table or drawing
Scoring Type: Semi-professional
Administration Mode: Group

Age:		9
Package-Exercise:		04-06
National P-value:		
	RK09	71.60

Timing: (in seconds)

	Stimulus:	2
	Response:	15
RK09	Exercise total:	17

SCORING GUIDE
RK09
K20041-1

00 = No Response

10 = Triangle

20 = Square; rectangle

21 = Other Unacceptable; e.g., box

39 = I Don't Know.

C. NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS DATA SUMMARY

National Assessment of Educational Progress Data Summary

	NATL.	REGION				SEX		SIZE AND TYPE OF COMMUNITY							RACE		PARENT'S HIGH SCHOOL ED				SIZE OF COMMUNITY			
	%	S.EAST	WEST	CENTRAL	N.EAST	MALE	FEMALE	INNER CITY	EXTREME RURAL	REST OF BIG CITY	MEDIUM CITY	SMALL CITY	SUBURBAN FRINGE	EXTREME AFF SUB	WHITE	BLACK	NONE	SOME	GRAD	POST	BIG CITY	SMALL PLACE	MEDIUM CITY	BIG CITY FRINGE
RESULT: 081601 What do you think the person who wrote this story was trying to do?																								
AGE: 09 RESPONSE: DK I don't know																								
EFFECT	3.0	2.0	-0.8	0.0	-0.8	0.7	-0.7	0.0	2.5	-2.3	1.3	-0.7	0.8	-0.8	-0.7	4.1	4.4	0.6	-0.5	-1.7	-1.6	0.1	1.6	0.2
S.E. P	0.5	1.4	0.5	0.4	0.9	0.8	0.4	1.2	2.3	0.3	1.0	0.4	1.5	1.1	0.5	1.5	3.0	1.6	0.7	0.6	0.8	0.9	1.2	1.2
S.E. EFFECT		1.1	0.6	0.7	0.8	0.4	0.4	1.3	2.1	0.6	0.9	0.5	1.3	1.1	0.3	1.3	2.7	1.6	0.7	0.6	0.6	0.5	1.0	1.0
AGE: 09 RESPONSE: 01 Tell you what fish are like																								
EFFECT	8.8	2.9	0.8	-2.0	-0.7	0.8	-0.8	3.8	-2.0	-1.4	0.9	-0.4	0.1	1.3	-0.4	2.1	-1.8	1.1	1.2	-1.5	0.9	-0.8	0.5	0.2
S.E. P	0.8	0.9	0.8	0.8	0.8	0.6	0.6	2.1	0.8	1.0	1.2	0.6	1.2	2.1	0.5	1.1	1.1	2.5	0.9	0.4	1.1	0.5	1.1	1.1
S.E. EFFECT		0.8	0.7	0.6	0.7	0.4	0.4	2.1	0.9	0.9	1.2	0.6	1.1	1.9	0.2	1.1	1.1	2.4	0.8	0.5	1.0	0.5	1.0	1.9
AGE: 09 RESPONSE: 02 Tell you that fish wear shoes																								
EFFECT	5.3	2.6	-0.3	-1.8	0.1	0.5	-0.5	3.2	1.1	0.5	-1.0	0.3	0.8	-4.1	-1.0	6.7	0.8	-0.8	0.7	-1.5	0.3	0.3	-1.2	0.1
S.E. P	0.5	1.5	0.9	0.7	1.2	0.7	0.6	1.5	1.5	1.2	1.3	0.9	1.6	0.6	0.5	1.5	2.1	1.3	0.8	0.8	1.1	0.4	1.2	1.3
S.E. EFFECT		1.2	0.8	0.7	1.0	0.4	0.4	1.5	1.4	1.1	1.2	0.8	1.6	0.7	0.3	1.3	1.9	1.3	0.6	0.6	1.0	0.6	1.0	1.1
AGE: 09 RESPONSE: 03* Tell you a funny story about a fish																								
EFFECT	75.3	-11.6	3.2	4.2	2.0	-3.3	3.3	-17.4	-0.0	4.0	-0.4	-0.9	2.4	4.5	4.2	-22.4	-4.2	1.9	-1.7	6.3	-1.8	-0.6	-0.0	3.3
S.E. P	1.2	2.0	1.8	3.0	1.9	1.6	1.4	3.5	4.0	2.3	3.1	2.2	3.6	3.9	1.2	2.9	3.8	4.2	1.8	1.6	2.0	2.0	2.7	3.4
S.E. EFFECT		1.9	1.8	2.3	1.8	0.9	0.9	3.3	3.7	2.4	2.9	1.8	3.1	3.4	0.6	2.6	3.7	3.9	1.8	1.1	1.9	1.6	2.5	2.9
AGE: 09 RESPONSE: 04 Tell you that fish don't like to swim																								
EFFECT	12.0	4.1	-2.5	-0.5	-0.5	1.3	-1.3	10.4	-1.6	-0.8	-0.8	1.8	-4.1	-0.8	-2.0	9.4	0.4	-2.8	0.3	-1.6	2.3	0.9	-0.9	-3.7
S.E. P	0.7	1.1	1.2	1.7	1.2	1.0	1.0	2.6	1.8	1.9	1.5	1.5	1.9	2.0	0.7	1.8	2.4	2.6	1.4	1.0	1.5	1.3	1.3	1.7
S.E. EFFECT		1.1	1.1	1.3	1.1	0.7	0.7	2.5	1.6	1.8	1.4	1.2	1.8	2.0	0.3	1.6	2.4	2.3	1.2	0.9	1.3	1.0	1.3	1.5
EXERCISE: 0817 Text not released																								
RESULT: 081701 Question 1																								
AGE: 09 RESPONSE: DK I don't know																								
EFFECT	39.2	-0.8	-0.6	-1.9	3.2	-0.6	0.6	6.5	5.2	-5.3	2.9	-3.4	3.1	-1.9	-0.5	2.8	-2.8	1.8	-0.6	-5.2	-2.8	-1.2	3.2	2.8
S.E. P	1.1	2.5	2.5	1.6	2.0	1.2	1.5	3.6	3.6	1.5	2.7	1.8	2.9	3.4	1.2	2.9	3.7	4.6	1.9	1.5	1.5	1.4	2.6	2.7
S.E. EFFECT		2.2	2.1	1.5	1.8	0.9	0.8	3.5	3.3	1.7	2.4	1.6	2.7	3.3	0.5	2.7	3.8	4.1	1.6	1.3	1.5	1.3	2.3	2.5
AGE: 13																								
EFFECT	10.9	-2.1	0.5	0.3	1.1	0.8	-0.8	-1.1	-5.3	-8.2	-3.2	2.8	2.9	0.2	-0.4	1.8	-0.9	0.8	-1.0	0.5	-0.9	0.9	-3.1	2.1
S.E. P	0.9	1.7	1.4	2.0	1.9	1.2	1.2	2.5	1.5	1.8	1.7	2.1	1.7	2.5	0.9	3.0	2.7	2.2	1.1	1.1	1.8	1.7	1.8	1.6
S.E. EFFECT		1.6	1.3	1.6	1.7	0.7	0.8	2.5	1.7	1.8	1.7	1.5	1.6	2.4	0.5	2.6	2.5	1.9	1.0	0.9	1.7	1.2	1.7	1.5
AGE: 09 RESPONSE: 00 No response																								
EFFECT	0.8	-0.1	1.1	-0.3	-0.6	0.3	-0.3	-0.3	-0.8	0.8	-0.2	0.3	0.2	-0.8	-0.0	0.0	2.5	-0.2	0.0	-0.2	0.2	0.0	-0.3	-0.0
S.E. P	0.2	0.5	0.4	0.1	0.2	0.4	0.2	0.5	0.0	0.5	0.4	0.6	0.4	0.0	0.2	0.5	2.1	0.6	0.5	0.2	0.3	0.4	0.4	0.3
S.E. EFFECT		0.5	0.5	0.3	0.2	0.2	0.2	0.5	0.2	0.5	0.4	0.4	0.4	0.2	0.1	0.4	2.0	0.6	0.4	0.3	0.3	0.3	0.4	0.3
AGE: 13																								
EFFECT	0.2	-0.2	-0.2	0.0	0.3	0.0	-0.0	0.1	-0.2	-0.2	-0.2	0.6	0.1	0.3	0.0	-0.2	-0.2	-0.2	-0.1	0.2	0.2	-0.0	-0.2	0.2
S.E. P	0.1	0.0	0.0	0.2	0.3	0.1	0.1	0.2	0.0	0.0	0.0	0.2	0.2	0.3	0.1	0.0	0.0	0.0	0.1	0.2	0.3	0.1	0.0	0.2
S.E. EFFECT		0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.4	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2
AGE: 09 RESPONSE: 03* Correct response																								
EFFECT	19.4	-2.6	-0.4	2.3	0.0	1.1	-1.1	-0.8	1.7	1.3	-0.1	-1.6	1.8	-0.7	0.4	-1.8	6.1	4.6	-1.3	0.9	1.1	-3.6	-0.8	6.9
S.E. P	0.9	1.4	1.3	1.6	2.4	1.3	1.3	2.6	2.2	2.0	1.8	1.5	2.7	2.5	0.9	1.8	3.9	3.3	1.7	1.5	1.5	1.3	1.9	2.5
S.E. EFFECT		1.4	1.3	1.4	1.9	1.3	0.9	2.7	2.1	1.9	1.7	1.2	2.4	2.4	0.3	1.7	3.7	3.1	1.4	1.0	1.4	1.9	1.7	2.0
AGE: 13																								
EFFECT	38.1		-1.4	-0.8	-1.6	0.2	-0.3	4.0	2.9	[illegible]	-1.1	1.1	-2.9	-2.4	-1.0	4.4	9.0	-1.9	0.3	-1.7	0.4	1.5	0.1	-3.3
S.E. P	0.9		0.8	1.4	1.4	0.4	1.4	3.6	3.9	2.5	1.5	1.3	[illegible]	2.3	0.7	2.4	3.8	2.4	1.3	1.4	1.7	1.3	1.7	1.3
S.E. EFFECT			0.8	1.2	1.3	0.4	0.9	3.5	3.6	2.6	0.9	1.3		2.1	0.4	2.1	3.9	2.5	1.1	1.0	1.5	1.0	1.4	1.3

D. NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS (NAEP) SIZE AND TYPE OF COMMUNITY REPORTING CATEGORIES

The NAEP[1] categorization scheme is described as:

> Size and Type of Community (STOC)
>
> The seven size and type of community (STOC) reporting categories are comprised of three "extreme" types of community (TOC) and four "residual" sizes of community (SOC). Each TOC category includes approximately 10% of the respondents at each age level; the remaining respondents are classified according to one of the SOC classifications.
>
> Briefly, the three TOC categories are (1) city areas where a high proportion of the adult population is either not regularly employed or on wlefare and a low proportion is employed in professional or managerial positions; (2) rural areas where a high proportion of adults are farm workers and a low proportion are professional, managerial or factory workers; and (3) near-city and city areas where a high proportion of adults are employed in professional or managerial positions and a low proportion are factory or farm workers, not regularly employed or on welfare. Respondents are placed in one of these categories if the occupational profile and location of the school or, in the case of the out-of-school sample, segment satisfy the extreme TOC definitions.
>
> The remaining respondents at each age level are classified according to the size of community in which the school or segment is located. The occupational profile is based on the employment categories summarized in Exhibit A-3.
>
> For the in-school sample at each age and the supplementary sample at age 17, the school principal of each selected school provided estimates to the percentage of students whose parents fit into each occupational category.

---

[1] National Assessment of Educational Progress, General Information Yearbook. Report No. 03/04-GIY. December, 1974, pp 41-43.

Other occupational data for the out-of-school sampel was obtained from census data in Year 03 and from the respondents themselves in Year 04. The definitions used to classify respondents by STOC are presented in Exhibit A-4. The occupational index is computed using the occupational categories summarized in Exhibit A-3.

EXHIBIT A-3. Occupational Categories

Categories	Code
Professional or Managerial Personnel	A
Sales, Clerical, Technical or Skilled Workers	B
Factory or Other Blue Collar Workers	C
Farm Workers	D
Not Regularly Employed	E
On Welfare	F

EXHIBIT A-4. National Assessment Size and Type of Community (STOC) Reporting Categories

Reporting Category	Occupational Index*	Description
Low metro	E+F-A	Sample schools or segments in a city or metropolitan area of a city with a population greater than 150,000 and in the 90-99th percentile of the low metro index
Extreme rural	E-(C±2A)	Sample schools or segments in community with a population less than 25,000 and not classified as extreme rural
Medium city		Sample schools or segments in a city with a population between 25,000 and 200,000 and not classified as low metro or high metro
Main big city		Sample schools or segments within the city limits of a city with a population greater than 200,000 and not classified as high metro or low metro
Urban fringe		Sample schools or segments in the metropolitan area of a big city but outside the city limits and not classified as low metro, extreme rural or high metro
High metro	A-(C+D+E+F)	Sample schools or segments in a city or metropolitan area of a city with a population greater than 150,000 and in the 90-99th percentile on the high metro index

*See Exhibit A-3

E. STATEMENT BY W. JAMES POPHAM TO THE HOUSE GENERAL SUBCOMMITTEE ON EDUCATION ON CRITERION-REFERENCED TESTS

STATEMENT BY W. JAMES POPHAM, UNIVERSITY OF CALIFORNIA, LOS ANGELES, CALIF.

You can't measure mileage with a tablespoon. But everyone knows that, so no one tries to. After all, tablespoons were designed to serve a clearly identifiable measurement function, thus they are never employed for assessing such things as distance, sound and heat. Significant problems arise, however, when the mission of a measuring instrument is not so patently obvious, hence it can be mistakenly used in situations whereby it yields apparently respectable but misleading data.

For there are seductive dangers associated with the possession of data. We live in an increasingly evidence-conscious society, and the person who can trot forth a sufficiently impressive array of data often becomes the winner in policy disputes. After all, our data-devotee will claim that he has the facts and the other side operates only on intuition. But, quite obviously, the quality of a data-based argument or decision depends on the quality of the data. Injudicious selection of measuring instruments is likely to yield indefensible data. Unfortunatly, in the field of education we are currently suffering from the afflictions of a markedly misapplied measurement tradition.

Not only with respect to the particular bill currently under consideration by this Committee, but because misperceptions regarding appropriate measurement strategies may impinge upon one's appraisal of comparable legislation, it is necessary to draw distinctions between two major measurement methodologies as they relate to determining the basic academic capabilities of the nation's youth. More specifically, differences will be identified between a *norm-referenced measurement* approach and a *criterion-referenced measurement* approach. The purpose of these two assessment strategies will be examined along with illustrations of how, if the wrong type of approach is utilized, misleading data will result.

THE BASIC DISTINCTION

Norm-referenced measures are used to ascertain an individual's performance in relationship to the performance of other individuals on the same measuring device. The meaningfulness of an individual score emerges from the comparison. It is because the individual is compared with some normative group that such measures are described as norm-referenced. Most standardized tests of achievement or intellectual ability used in this country can be classified as norm-referenced measures. Such tests are designed to yield a series of *relative* performance descriptions, that is, relative to the norm group. It is expected that we will be able to distinguish between Mary who scores at the 65th percentile (of the norm group) and Harry who scores at the 48th percentile (of the norm group).

Criterion-referenced measures are used to ascertain an individual's status with respect to some criterion, that is, an explicitly described type of learner competence. It is because the individual's performance is compared with an established criterion, rather than the performance of other individuals, that these measures are described as criterion-referenced. The meaningfulness of an individual score is not dependent on comparisons with other individuals who took the test. We want to know what an individual can do, not how he stands in comparison to others. For example, the dog owner who wants to keep his dog in the back yard may give the dog a fence-jumping test. The owner wants to find out how high the dog can jump so that the owner can build a fence high enough to keep the dog in the yard. How the dog compares with other dogs is irrelevant. Another example of a criterion referenced test would be the Red Cross Senior Lifesaving Test, where an individual must display certain swimming skills to pass the examination irrespective of how well others perform on the test. Merely because a group of weak swimmers sign up to take the lifesaving test on a given occasion would not mean that the best performance of that group would necessarily be high enough to pass the test.

Since norm-referenced measures are devised to facilitate comparisons among individuals, it is not surprising that their primary purpose is to make decisions about individuals. Which pupils should be counseled to pursue higher education? Which pupils should be advised to attain vocational skills? These are the kinds of questions one seeks to answer through the use of norm-referenced measures, for many decisions regarding an individual can best be made by knowing more about the "competition," that is, by knowing how other, comparable individuals perform.

Although criterion-referenced tests are also used to make decisions about individuals, there is usually a difference in the context in which such decisions are made. Generally, a norm-referenced measure is employed where a degree of selectivity is required by the situation. For example, when there are only limited openings in a company's executive training program, the company is anxious to identify the best potential trainees. It is critical in such situations, therefore, that the measure permit *relative* comparisons among individuals. On the other hand, in situations where one is only interested in whether an individual possesses a particular competence, and there are no constraints regarding how many individuals can possess that skill, criterion-referenced measures are preferable. In this sense, criterion-referenced measures may be considered *absolute* indicators.[1]

THE MISAPPLIED MEASUREMENT TRADITION

For many years in our nation we have relied heavily on the use of norm-referenced measures. Almost without exception, the many standardized achievements tests used throughout the land fit the classic norm-referenced measurement model. When these devices were used in a fashion consistent with their chief mission, that is, to permit comparisons among individual pupils, then appropriate data were produced. But when these tests were used for other purposes such as to secure a clear picture of what reading skills a particular child possessed, then the resulting data may have typically been more misleading than helpful.

Yet, because these tests have been widely used for so many years, and because they are produced by reputable commercial publishers (who distribute them with a host of sophisticated measurement trappings such as technical reliability and validity reports), many educators and most citizens assume that standardized achievement tests are the only respectable instruments one should use when attempting to find out how well our schools are working, or more specifically, just how well an individual pupil is learning.

For purposes such as these, the use of a norm-referenced test will often produce spurious data. And the tragedy is that such data may be influential in arriving at far-reaching decisions regarding our nation's educational enterprise. For example, several recent reports have focused on extensive analyses of the relative contribution of numerous factors to the quality of education. The results appear to be disappointing. Teacher don't seem to make much of a difference. Indeed, schools themselves don't seem to make much of a difference. But much of a difference *with respect to what?* Invariably the index of pupil achievement used in these large scale analyses has been performance on norm-referenced tests. And, as we shall see, there are characteristics of these measures which render them sufficiently inappropriate for such analyses that the resulting data and subsequent conclusions should be viewed with great suspicion if not complete disdain.

DEFICIENCIES IN NORM-REFERENCED TESTS

There are two main problems with typical standardized tests, which render them unsuitable for widescale use in assessing the status of our children's educational attainments. These deficits are associated with the interpretability and the psychometric properties of norm-referenced tests.

Interpretability.—Most standardized tests are developed by commercial test publishers who must design the instruments so that they can effectively service an entire nation. Practical economics preclude test publishers from developing a separate test for New York and another version for North Dakota, even though the instructional emphases of these two states may vary considerably. The way that test publishers get out of this bind is to develop a *very general* test which, while it may not be perfectly congruent with a given school district's curricular preferences, will at least cover some of them. But to the extent that a particular district is emphasizing content and skills other than those included in the very broad standardized test, a misleading impression of the district's effectiveness or an individual child's capabilities may be created by the use of such tests.

Indeed, it is to the advantage of the commercial test publishers to keep achievement tests at very general levels, for then educators throughout the nation can derive the characteristic Rorschach dividend; they can usually see what they want to in an ink blot. Thus, when certain tests yield subscale scores such as "reading comprehension," it is inordinately difficult to get a precise fix on what is meant by that score. Only by dissecting the test itself can the user secure a defensible idea of what the instrument is measuring. For purposes such as accurately locating our nation's educationally disadvantaged youngsters, we need more crisp interpretations than are afforded by the bulk of norm-referenced tests.

---

[8] For a more detailed treatment of the distinctions between norm-referenced and criterion-referenced measurement approaches, see Popham, W. J. (Ed.) "Criterion-Referenced Measurement: An Introduction," Educational Technology Publications, Englewood Cliffs, N. J., 1971.

Statement by Popham (3)

Just imagine that by employing a standardized achievement test we had [illegible] a child who scored below the tenth percentile on a mathematics achievement test. We know, of course, that we have a child who needs help in math. But what kind of help? The typical scores on a standardized math achievement test are often given in phrases as general as "basic operations" or "geometric relationships." With such imprecise descriptors it is next to impossible to really identify what the learner's weaknesses are, much less to correct them.

Psychometric properties.—As we have seen, the chief purpose of norm-referenced tests is to permit comparisons among individuals. Because of this, such tests must produce *variant* scores. In fact, the more that pupil scores can be spread out, the better. Test items which are answered correctly by most students, since they contribute little to total score variance, must be deleted or modified. To contribute to total score variance an ideal item is one which is answered correctly by half the people taking the test (preferably those who scored highest on the total test) and incorrectly by the other half (preferably those who scored lowest on the total test). Most standardized tests which have been revised several times contain a great many such items since, for purposes of spreading out those taking the test, these items function effectively. But, in general, such test items are most highly correlated with *native intellectual ability.* In other words, as standardized achievement tests are revised and refined through the years in order to maximize the variability of pupil scores, they more and more closely resemble a classic intelligence test. Thus, norm-referenced tests are often quite insensitive to detecting the effects of even high quality instruction.

To illustrate, suppose a teacher attempts to teach an important concept and, prior to instruction, administers a test item which almost everyone misses. Yet, after a really fine instructional job, the same test item is answered correctly by *everyone.* But, because it produces no score variance among students, this kind of item would have to be excluded from a standardized achievement test. This not only leads to insensitive tests but creates the further problem that oft-revised standardized tests many times do not contain the very test items which deal with the central concepts of a field.

COUNTERACTIONS BY CRITERION-REFERENCED TESTS

Largely in an effort to remedy some of the weaknesses of norm-referenced measures, criterion-referenced tests are designed in such a way as to (1) be more accurately interpretable, (2) detect the effects of good instruction, and (3) allow us to make more accurate diagnoses of individual learners' capabilities.

Defined pupil competencies.—One of the important ingredients of a well devised criterion-referenced test is an explicitly defined criterion. Putting it another way, since the whole conception of this measurement strategy is based on referencing scores to a criterion set of learner behaviors, then the behaviors must be described without ambiguity. Most current criterion-referenced measurement specialists are advocating that a *domain* of learner behaviors be delineated in such a way that from the domain description (often called an item form) an almost unlimited number of test items could be generated. It must be noted that "test item" should be conceived of as representing a wide range of measurement techniques, not merely paper and pencil tests. Because of the characteristic accuracy of the criterion descriptions, we have a far better idea of what it is that the student can or can't do. This becomes particularly important when, upon assessing the students, we discover serious educational deficiencies. With a typical norm-referenced test we would have only a global idea of the general sort of student weakness; with a criterion-referenced test the deficits can be pinpointed and thus more readily ameliorated.

Sensitivity to instruction.—Because criterion-referenced tests need not produce considerable score variance, they can consist even of items which, after instruction, most learners answer correctly. They can retain items which are based on the primary curricular emphasis. As a consequence, such tests are characteristically more sensitive than norm-referenced tests for purposes of detecting instructional effects.

Accurate diagnoses.—Because they are more carefully explicated, criterion-referenced tests typically provide us with a more fine-grained analysis of exactly what the pupil can and can't do. The differential skills we hope learners will acquire can be more accurately portrayed via a well described criterion-referenced test in contrast to its often amorphous norm-referenced counterpart. And for promoting instructional improvement, accurate diagnosis is an indispensable first step.

Statement by Popham (4)

WHAT ABOUT TEACHING TO THE TEST?

Discussions such as these often lead to the assertion that precisely explicated tests will encourage instructors to teach to the test, and that such a practice is somehow reprehensible. Contrary to the wide-spread belief that teaching to the test is an instructional sin, we must recognize that *if the test is truly defensible*, then we should applaud those who can teach pupils to master it. The kind of test which will be defensible is not a particular set of items, however, but a *sample* from an almost infinite number of items that could be generated from our well described criterion. In other words, we should not be teaching to a given set of 10 double-digit multiplication problems, but instead to *any* set of 10 double-digit multiplication problems randomly selected from a well defined item pool. Thus the learner acquires mastery of a *class* of skills, not a limited number of items reflected by a particular test. This approach is central to proper use of criterion-referenced testing.

SPENDING MONEY AND MEASURING SKILLS

The general thrust of the legislation currently under consideration involves the distribution of federal educational funds on the basis of measured educational deficiencies rather than census determiners. Further, there appears to be a recognition of the importance of employing appropriate measurement methodology when identifying educationally disadvantaged youngsters. Assuming that sufficient care can be taken to support the development of high quality criterion-referenced measures for this purpose, the general scheme for targeting federal dollars appears to be sound. For when we are attempting to identify those young people who truly need educational assistance, then using outdated census figures as the determiner may be worse than measuring mileage with a tablespoon. It's more like measuring baking soda with a speedometer.

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